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ETHERNET AT HYPERSPEED

In our new Future Watch feature: How 10 Gigabit Ethernet could transform corporate networks in a year or two. Page 73

WHAT JOB LOYALTY?

Our survey shows that only 5% of your staff are safe from recruiters; 40% will be gone in a year. Page 52

CONVERGING FORCES

Businesses must ensure that sales, products and delivery channels all converge around the customer. Page 58

COMPUTERWORLD

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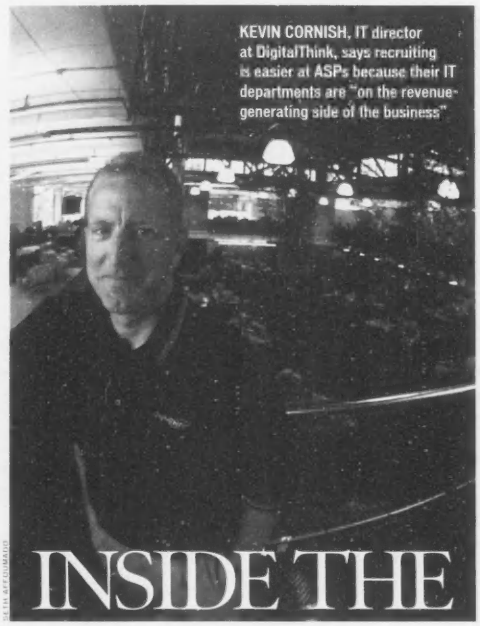

KEVIN CORNISH, IT director at DigitalThink, says recruiting is easier at ASPs because their IT departments are "on the revenue-generating side of the business"

INSIDE THE ASPs

CONSIDERING A CAREER MOVE TO AN ASP? Mark Hall provides the first look at what it's like to be the IT manager at an application service provider — where IT is the profit-making core of the business, not a cost center. The stress levels are high, but these IT executives find it exhilarating to work closely with business customers and to have a direct effect on their companies' bottom lines.

Story begins on page 48.

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NEWSPAPER

WINDOWS EASY HACKER TARGET

Experts say usability features can be exploited to launch virus attacks

BY JAIKUMAR VIJAYAN

The renowned user-friendliness — and popularity — of Windows software will continue to make the platform a prime target for hackers, warned users and analysts in the aftermath of the "I Love You" virus and its variants last week.

In addition, they said, Windows' evolution from a stand-alone desktop environment gives it features that can be exploited relatively easily by hackers in a networked world.

In fact, the speed and ferocity with which the so-called Love Bug propagated itself across millions of Windows computers worldwide — while leaving users of Unix, Linux and Macintosh operating systems untouched — underscores that fact.

LOVE BUG

"Creating viruses to attack Microsoft Windows is not rocket science," said Dave Stringer-Calvert, a senior project manager at Stanford Research Institute International in Menlo Park, Calif. "There is no doubt that we will see another virus targeted at Windows users very shortly, and it could be far more damaging than the 'I Love You' [virus]."

Repeated calls to Microsoft Corp. late last week for comment weren't returned.

Making Windows applications a particularly attractive target is their huge installed base and the relative ease with

Windows, page 95

H-1B VISAS GONE; FEW OPTIONS LEFT

Hiring overseas labor possible but not easy

BY JULEKHA DASH

Unless the federal government decides to raise this year's cap on H-1B visas, employers will be left with only a few alternative means of hiring overseas labor, none of which is ideal.

These alternatives — which include hiring overseas employees to work in foreign offices and raiding other companies for H-1B staff — are limited to workers in a particular region or to those who have fulfilled certain conditions of

H-1B Visas, page 14

B-TO-B XML HARDER THAN ANTICIPATED

RosettaNet deployment just starting after 2 years

BY CAROL SLIWA

The travails the RosettaNet consortium has experienced in trying to launch its XML-based business-to-business e-commerce standards effort could serve as a bellwether for the thousands of companies that have yet to join the herd.

But IT professionals hoping to learn from RosettaNet's example will have to wait until fall — if not 18 months or longer — before they will be able to take stock of one the earliest industry efforts.

RosettaNet (*www.rosettanet.org*) is the computer and electronic components industries' nonprofit effort to develop and deploy standard electronic-business interfaces.

RosettaNet members have made significant strides in developing ambitious business-process standards over the past two years, having nailed down 15 so far. But many firms are just starting to complete their first production-ready implementations as they attempt

B-to-B XML, page 16

WIRELESS TRAVEL APP NEARLY READY

Galileo using XML to link to mainframe data

BY JULIA KING

Next month, Galileo International Inc. and Sprint Corp. will announce an automated travel-planning tool that lets Sprint cellular phone users tap into Galileo's huge mainframe-based reservation system to create or change travel itineraries on the fly.

The Sprint service will be

Wireless App, page 16

GALILEO'S JIM LUBINSKI sees a "huge revenue opportunity"

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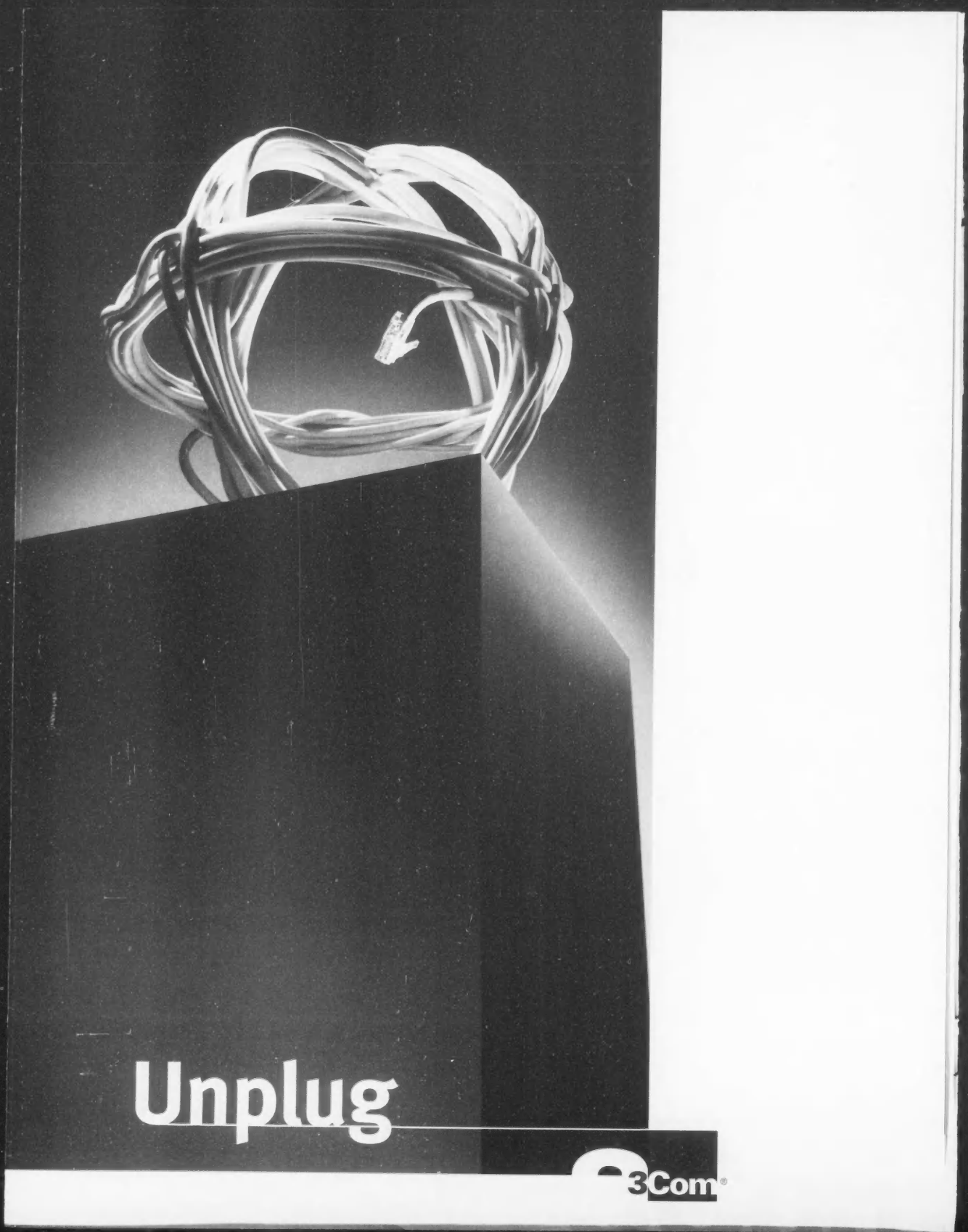
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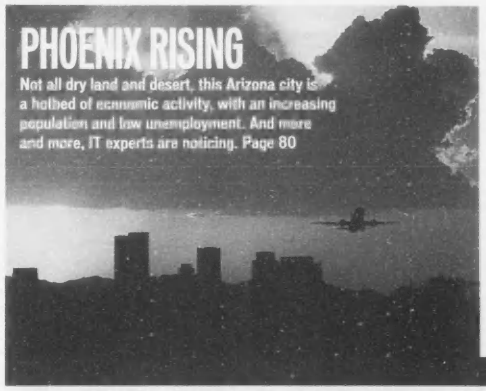

PHOENIX RISING

Not all dry land and desert, this Arizona city is a hotbed of economic activity, with an increasing population and low unemployment. And more and more, IT experts are noticing. Page 80

AFTER Y2k

What happened to former Y2k managers? Many moved into e-commerce and ERP work. Ed Hourihan (pictured) used Y2k to help form an India-based business. But for others, life after the date change hasn't been rosy. Page 56

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73 **ETHERNET IS ABOUT** to make its next quantum leap to 10G bit capacity, which translates into enormous potential for moving large quantities of data at hyperspeed.

"If there were ponies still traveling across Europe, we'd probably use those, too."

SELWYN GERBER OF INVESTMENT FIRM PRIMEGLOBAL LLC, WHOSE COMPANY CONSIDERS THE INTERNET SO INSECURE THAT IT WON'T USE THE WEB AT ALL TO SEND CUSTOMER DATA, PREFERRING FAXES AND FEDEX.

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IBM Releases Servers That Challenge Sun

Users: Midrange Unix systems leapfrog the competition at two-thirds the price

BY JAIKUMAR VIJAYAN

THE NEW UNIX servers announced by IBM last week should close the widening price/performance gap in the midrange market between IBM and rivals such as Sun Microsystems Inc. and Hewlett-Packard Co., users and analysts said.

IBM last week fleshed out its Unix server lineup with three new models that feature the copper technology and many of the features found on its high-end S80 RS/6000 servers.

New features include hot-swappable components such as hard disks and CPUs, dynamic CPU deallocation for isolating potential processor problems, redundant power and cooling systems and a service processor for monitoring vital system signs. Also offered are high-availability services and technologies such as clustering, targeted at service providers and e-commerce applications.

Pricing for the least-expensive model starts at $18,995, and the top-end system starts at $67,995. This should make the new servers attractive to users, said Richard Fichera, an analyst at Giga Information Group Inc. in Boston.

"The systems look impressive and are certainly going to help IBM put some pressure on Sun and HP," Fichera said.

Ursus Telecom Corp., an Internet service provider in Sunrise, Fla., plans to deploy the servers worldwide for its Stream.com Internet telephony offering, said S. Jay Chavez, a vice president at the company. "From what I have seen . . . they come in at about two-thirds the price of a comparable Sun system," he said.

AT A GLANCE

Next Generation

IBM's new Unix midrange:

- **RS/6000 Enterprise Server M80** Support for up to eight 500-MHz, 64-bit RS64 III processors; up to 32GB of memory; and a 4MB Level 2 cache
  Entry price: $67,995
- **RS/6000 Enterprise Server H80** Up to six 500-MHz RS64 III processors, up to 16GB of memory and a 2MB Level 2 cache
  Entry price: $21,995
- **RS/6000 Enterprise Server F80** Up to four 500-MHz processors, up to 16GB of memory and a 2MB Level 2 cache
  Entry price: $18,995

SOURCE: IBM

"I think they are leapfrogging the competition," in terms of technology, said Hugh Hale, a senior information technology manager at BlueCross/BlueShield of Tennessee in Chattanooga, which uses S80s to run its managed-care application.

IBM's latest midrange offerings come at a time when its S80 systems — announced last fall — may finally be gaining ground against Sun's popular E10000 servers, said Lee Kroon, an analyst at D. H. Andrews Group Inc. in Cheshire, Conn. "IBM shipped 1,000 of those systems in the first 100 days. It clearly ruffled Sun's feathers pretty badly," he said.

Making an impression with such products is going to be crucial if IBM is to reverse its hardware slump, said Sam Albert, president of Sam Albert Associates, a consultancy in Scarsdale, N.Y.

IBM CEO Louis V. Gerstner last week told analysts not to expect dramatic growth from IBM this year because of companies' delays in buying enterprise servers after year 2000 lockdowns. Analysts promptly lowered their expectations for IBM for the rest of the year.

Microsoft: Breakup Would Unleash 'Chaos,' Hurt Economy

But it may be too late to convince judge

BY PATRICK THIBODEAU
WASHINGTON

In court papers filed last week, Microsoft Corp. said a breakup of the company would be akin to unleashing a doomsday bomb: It could potentially create "chaos" and "destroy" the company while causing employees to leave "in droves."

"No one would seriously suggest that star basketball players like Michael Jordan are replaceable," said Microsoft, in its legal documents, "and no one would seriously suggest that the special chemistry that enabled the Chicago Bulls to lead the NBA for much of the 1990s would persist had the team been broken in two."

Microsoft has begun the task of trying to convince antitrust trial judge Thomas Penfield Jackson that the government's plan to break the company apart and separate the Windows operating system from its applications is not only wrongheaded but also a threat to the economy. Last week, Microsoft asked the judge to dismiss that plan.

Jackson ruled last month that Microsoft violated antitrust law by using anticompetitive practices to tilt the market scales in its favor.

"Not only is the breakup an unprecedented remedy in the 110-year history of the Sherman Act, it is also an entirely unwarranted remedy," said Bill Neukom, Microsoft's executive vice president for law and corporate affairs. "Breaking up this company would be a punitive proposal that would fundamentally harm consumers, the industry and the American economy."

Government officials aren't buying that argument. "I think Microsoft is in denial: It continues to deny doing anything wrong and is offering nothing new," said Connecticut Attorney General Richard Blumenthal, one of the state attorneys in the lawsuit filed against Microsoft by 19 states and the U.S. Department of Justice.

Some legal experts said it may be too late for Microsoft to influence Jackson.

"The game is basically over. And Microsoft knows that the appellate court is its only real shot," said Hillard Sterling, an attorney at Gordon & Glickson LLC in Chicago. "Judge Jackson is on the verge of ordering a breakup, almost regardless of what Microsoft says."

The government is expected to respond Wednesday to Microsoft's request for a dismissal. It's also expected to counter Microsoft's proposal, which outlines a series of conduct remedies that would broadly affect its licensing and pricing arrangements with PC makers. The plan also ensures timely access to technical information for independent software developers.

Microsoft is also arguing that it's a unique company far different from AT&T Corp. and Standard Oil Co. — which were broken up years ago — especially where its intellectual property is concerned. Its greatest asset is its employees, who may leave "in droves" if the breakup goes through, the company said.

History's Lessons

But Microsoft isn't the first company involved in an antitrust case to warn of dire economic consequences that could result from a breakup, said William Kovacic, a law professor at George Washington University in Washington.

"Standard Oil told the Supreme Court that a breakup would have calamitous effects throughout the economy in 1911," said Kovacic. "[AT&T] said that the U.S. would pay a terrible penalty, in reduced innovation and poor telephone service." Those "catastrophes" didn't happen, he noted.

But Yee Wah Chin, an antitrust lawyer at Squadron, Ellenoff, Plesent & Sheinfeld LLP in New York, said she believes that Microsoft can raise doubts about the breakup's impact by arguing that some of its core products were developed internally and not acquired, unlike in the case of Standard Oil.

Rich Gray, an antitrust attorney in Menlo Park, Calif., said the Microsoft briefs may help the company fight a breakup plan on appeal, should the judge impose it.

One argument is based on Jackson's own finding that the government didn't prove that the illegal acts prevented Sun Microsystems Inc. or Netscape Communications Corp. from being able to compete with Windows, said Gray.

"Overall, I think Microsoft has made a very strong argument against a breakup, stronger than I expected," said Gray. "I'm not sure that it will convince Judge Jackson, but I think it will play very well at the appellate level."

Redmond's Counterplan

Microsoft's counterproposal to the government's breakup plan includes restrictions on the company's business practices.

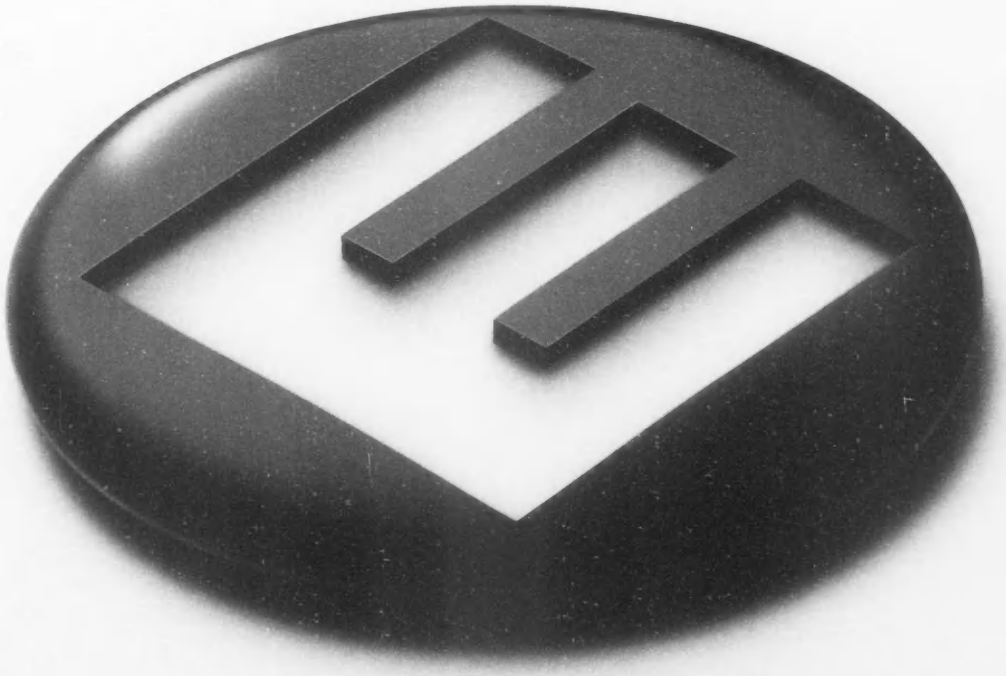
PC makers would be able to delete the Internet Explorer icon and make a non-Microsoft browser the default.

Independent developers would get timely and complete access to application programming interfaces and other technical information.

The company would be prohibited from using its licensing contracts to limit the distribution of non-Microsoft products.

When the company released a major operating system, it would continue to make the predecessors available, with no increase in royalty payments.

The company would pay the attorneys' fees and other costs incurred by the 19 plaintiffs in the lawsuit.



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AT DEADLINE

Virus Probe Narrows

At press time, the latest suspects in the "I Love You" virus case were a disgruntled student at AMA Computer College (AMACC) in the Philippines, who failed to graduate because his thesis about creating a password-stealing program was rejected, and his friend in a student computer club.

Philippines investigators identified the suspects as Onel De Guzman, a computer science student at AMACC, and Michael Buen, who graduated from AMACC this month. Both are allegedly members of a student organization of computer programmers called GRAMMERsoft.

Investigators were still trying to identify 10 other suspects, possibly AMACC students as well.

ActiveX Flawed

A flawed ActiveX control makes computers running Microsoft Corp.'s Internet Explorer Version 5.0 or Office 2000 vulnerable to virus infections on most e-mail systems, even if users don't open infected attachments, according to the SANS Institute.

The Bethesda, Md.-based computer security think tank revealed last week that default security settings on Internet Explorer permit users to receive viruses and spread them by viewing or previewing malicious e-mail without actually opening an attachment or visiting a malicious Web site.

The security hole is created by a flaw in an Explorer ActiveX control called scriptlet.typelib. While the hole can be closed in minutes using tools available on Microsoft's security site, simply updating antivirus tools isn't an effective solution, according to SANS.

Los Alamos Systems Escape Fire Damage

Fires in the vicinity of the Los Alamos National Laboratory in New Mexico last week caused no damage to information systems, said Nick Apodaca, the facility's information systems technical master. Even if there had been damage, daily backups would have prevented a loss of data, he said. By Friday afternoon, the fire had retreated to 30 miles from the facility and the lab was back to full staff, Apodaca said.

Experts: Viruses Show Necessity of Backups

Analysts, IT groups: Telecommuters most at risk because few back up hard drives

BY KATHLEEN OHLSON

USERS WHO don't back up data got a wake-up call when the "I Love You" virus hit corporations and government agencies around the world.

The virus destroyed JPEG and MP3 files and other multimedia files, and it's only a matter of time until a virus nails mission-critical files, analysts, security experts and eight information technology professionals said last week.

KATHY FORRESTER at Fleishman-Hillard says backups saved her job

Most at risk may be telecommuters and other mobile workers who, IT managers say, are prone to neglecting to back up their hard drives.

"Users are getting the message, but most of the time they don't follow it," said Ira Winkler, president of the Internet Security Advisors Group in Severna Park, Md. "By the time they need to do it, they've had some kind of disaster."

According to International Data Corp. in Framingham, Mass., twice as much data is stored on desktops than is stored centrally within an organization. However, 45% of corporate desktops and mobile PCs are never backed up, and only 27.3% are backed up once a week or more.

Despite the risks, analysts and users said they forgo backups because they take too long — up to an hour per user.

But some companies use automated backup software.

An automated backup system called Backup Exec from Veritas Software Corp. in Mountain View, Calif., proved its mettle at Fleishman-Hillard Inc., a St. Louis-based public relations firm with 45 offices and 2,000 users worldwide.

"I'm so glad [backups are done], or I would be out of a job," said Kathy Forrester, senior vice president of Fleishman's IT department. The agency lost 4,000 JPEG files to the "I Love You" virus in St. Louis and hundreds of files in each satellite office, Forrester said. Her team restored the files from tape backups.

However, not all companies appreciate the financial worth of backing up data.

Instead, they're more interested in managing employees and hitting deadlines, said Maria Schaefer, an analyst at Meta Group Inc. in Stamford, Conn.

Analysts and users said they were dumbfounded as to why companies haven't committed resources to do data backups.

"Data is a vital function of businesses — if you lose data, you lose everything," Forrester said. Some companies "don't understand how important [data] is" and don't see its value in financial terms, said Robert Stark, a database administrator and systems architect at ProxyMed Inc. in Fort Lauderdale, Fla.

In the end, though, users probably won't learn much from this latest outbreak, according to analysts and users.

"People's memories are short-lived, and [the "I Love You" virus] won't do much to change their behavior," said Dr. Robert Cecil, network director at the Cleveland Clinic in Cleveland.

A Backup Plan

Security experts, analysts and IT staff suggest that companies:

- Take backups seriously
- Educate users about them
- Back up all data weekly and mission-critical data daily
- Check to make sure each backup was performed
- Back up the backup

Attacks Breed Disaster Plans

Lesson taught by Melissa not lost

BY LEE COPELAND

As online viruses and cracker attacks proliferate, information technology shops are fighting back with a combination of end-user smarts and time-tested backup tapes.

Two weeks ago, the "I Love You" virus sailed through firewalls built to allow in Internet mail and crept past filters not yet updated to reject it. In the process, like a fanatical paramour, the self-replicating "Love Bug" disseminated a tainted "I Love You" missive to names listed in affected Microsoft Outlook address books.

Market research firm Computer Economics Inc. in Carlsbad, Calif., which called the virus a form of economic terrorism, estimated that more than 45 million e-mail users were hit on the first day and put the tab for downtime and lost files at $6.7 billion for the first five days of the virus's global trip.

Yet many companies, such as Caledon Laboratories Ltd. in Georgetown, Ontario, reported minimal damage, thanks to good end-user training and preventive measures.

At Caledon Labs, a specialty chemical solvent supplier, those steps included nightly backups of data and recurrent admonitions to users on the dangers of accepting love notes and other digital comeons in the form of attachments.

Back Up Every Byte

Steve Trinca, a senior technical specialist at Caledon, said not one user at his firm opened the Love Bug message. Trinca also keeps every byte of data on tapes that get backed up and rotated out of the office each night.

Some IT organizations have established procedures like taking systems off-line to sidestep the copycat viruses that typically follow the first virus attack, said analyst Samir Bhavnani at Computer Economics.

"Last year, the Melissa and Explorer.zip [viruses] got companies on the road to putting viruses under the security umbrella," he said. "Companies have started focusing on contingency plans: What happens when the next virus hits? When in doubt, they choose to shut down the [Internet] servers."

Idaho Power in Boise did just that when a user tipped off its help desk about the "Love Bug" at 7:30 a.m. on Thursday, May 4. The utility had taken its Internet and Exchange servers off-line by 7:45 a.m., but in that 15-minute span, the virus rampaged throughout 1,800 e-mail boxes and got into a 90-PC server farm.

"It was a hundredfold, a thousandfold worse than Melissa," said Linda Stewart, corporate data security administrator at Idaho Power.

About 28 hours later, after purging the virus, Idaho Power's Internet servers went back online. Stewart said it's still too early to know "the long-term fallout and to determine costs. But it is significant."

AT A GLANCE

Contingency Planning

- When in doubt, shut down servers and wait for the first wave of a virus and its mutations to pass
- Train end users about executables
- Install filters to disallow executables
- Back up data on tapes and store them in a safe place

MORE THIS ISSUE

For more on computer security and the "Love Bug," see pages 1, 6, 8 and 95.

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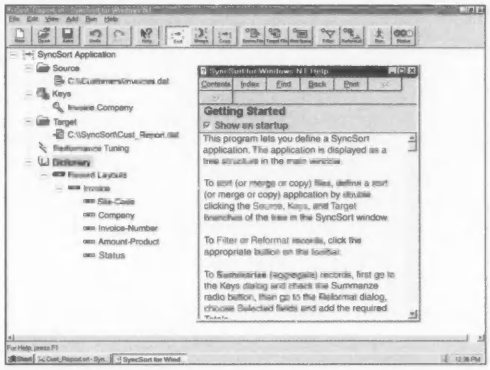
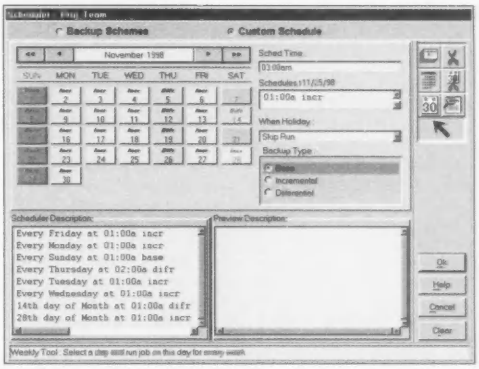


A familiar Windows-like graphical user interface gives you drag-and-drop access to all of SyncSort's powerful features on NT.

Staging your data with SyncSort lets you use the fastest database load techniques, reducing overall staging and load time by up to 90%. SyncSort also accelerates extract processing to speed warehouse-related statistical and reporting applications.

Backup Express: Powerful Backup with Centralized Control

Another of Syncsort's state-of-the-art products is Backup Express, a powerful enterprise backup/restore solution. Designed for distributed processing, Backup Express allows you to attach storage devices to any computer on your network,



Through the simple, intuitive Backup Express interface, you can schedule backups, run restores, add devices, or check job status.

whether it is running UNIX, Windows NT, or NetWare. Yet centralized administrative control is always maintained through an intuitive drag-and-drop graphical user interface. Support for efficient online and offline database backup is also included.

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Data warehouse specialists recently voted Syncsort one of the top vendors in the prestigious "Data Warehouse 100." This honor reflects not only the importance of Syncsort products in warehouse development and management, but also the high quality of Syncsort's responsive, reliable customer support.

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Some Users Bypass Cisco For Smaller Suppliers

Some less-visible network equipment makers are winning fans of their own

BY JAMES COPE

Although the booth of networking kingpin Cisco Systems Inc. was abuzz with browsers and buyers at Networld/Interop 2000 in Las Vegas last week, traffic was also brisk among the displays of smaller networking companies. And users have their reasons for not feeling compelled to go the Cisco route.

Jeffery Priester, global manager of networking services at Air Products and Chemicals Inc. in Allentown, Pa., for example, made a beeline for the display of Santa Clara, Calif.-based Extreme Networks Inc. Priester said he has standardized on Extreme's BlackDiamond line for switching at the core of his company's 12,000-node network.

"Many of the nodes are PCs, but devices like electron microscopes and other lab equipment are connected to it as well," Priester said, noting that network reliability and performance are critical to the firm's operations. Air Products manufactures and markets industrial gases and specialty chemicals.

Priester said that one reason he chose the Extreme product was its manageability. "Extreme's product line looks and works the same from the low to high end, and that makes it easy to manage," he said.

Extreme's profile was raised in March when it was designated by 3Com Corp. as the migration destination of choice for users of 3Com's discontinued CoreBuilder LAN switch line.

Yipes Communications Inc., a San Francisco-based service provider that sets up and manages LAN-to-LAN optical connections between buildings and geographically dispersed facilities, also uses Extreme equipment. Yipes Vice President Ron Young said his company installs Extreme's Summit switches in buildings it services and aggregates traffic on BlackDiamond switches at its private internetwork points of presence.

> From anywhere on the network to anywhere on the network, we have only 10 milliseconds of latency.
>
> RON YOUNG, VICE PRESIDENT, YIPES COMMUNICATIONS INC.

Yipes' focus is on speed and bandwidth-on-demand, Young said. "From anywhere on the network to anywhere on the network, we have only 10 milliseconds of latency," he said.

Another company, PurchasePro.com Inc. in Las Vegas, elected to use routers and firewalls from San Jose-based Cisco for its growing business-to-business procurement service.

But on the company side of the firewall are ServerIron load balancing switches from Foundry Networks Inc. in San Jose, said PurchasePro's director of systems and network services, Brandon Mikkelsen. Mikkelsen said these "smart" switches sense and distribute traffic to the most appropriate Web server, which speeds transaction processing and keeps any one server from getting bogged down.

PurchasePro uses Foundry's BigIron switching routers at the core of its network. The routers' nonblocking architecture makes them "twice as fast as comparable switches from Cisco," Mikkelsen said.

But according to Cisco, speed isn't everything.

"You can oversubscribe a Catalyst switch," said Walt Blomquist, Cisco's product line manager for the Catalyst switching family. "But most customers are making decisions now on end-to-end approaches, which go beyond feeds and speeds to include intelligent services." ▶

Why Users Embrace Smaller Net Vendors

- Consistency across product lines
- Faster performance at the network core
- Intelligent switching based on applications and content, plus load balancing

Companies Push New Approaches to Authentication

Novell, Microsoft offer alternatives to passwords for corporate network security

BY DOMINIQUE DECKMYN

Despite causing support and security headaches, passwords are still overwhelmingly the means by which users are authenticated on corporate networks. But at the Networld/Interop 2000 show in Las Vegas last week, Novell Inc. and Microsoft Corp. pushed alternative authentication methods.

NETWORLD/INTEROP 2000

Passwords that are scribbled on bits of paper or forgotten create problems for network administrators everywhere. In his Networld/Interop keynote address, Microsoft Chairman and Chief Software Architect Bill Gates called them the "weak link" in network security.

Two weeks ago, Microsoft said it would include the Biometric Application Programming Interface (BAPI), which it acquired from I/O Software Inc., in a future version of Windows. But Gates' keynote focused on smart cards, which are already supported in Windows 2000. He said smart cards will become the primary means of authentication in corporations.

Gates predicted, "Over time, every keyboard, every physical access within a corporation, will be based on having a smart card, or a smart card plus password." A smart card is a credit-card-size card that has a computer chip embedded in it.

Novell is taking a more diversified approach. The company announced the availability of a software layer that lets corporations combine multiple authentication technologies — from Novell and third parties — to implement "graded" access policies. The offering is called Novell Modular Authentication Service (NMAS) Enterprise Edition.

"User name and password is probably not going to suffice in the future," agreed Lee Roth, a LAN and security services manager at Southwest Airlines Co. in Dallas. "But whether it's going to be smart cards or biometrics, that's something that still needs to play out."

Roth is using authentication devices from ActivCard Inc. for some users. But such an approach is difficult to extend to all of his 27,000 users, most of whom are accessing the corporate network over the Internet.

"If you have to reach out and physically touch 20,000 people, that's a major obstacle," said Roth, who is going with digital certificates instead. He said he is considering using Novell's NMAS.

Smart cards solve one category of problems, said Frank Prince, an analyst at Forrester Research Inc. in Cambridge, Mass., but they create new potential headaches. For example, a user who lost or forgot his card but still needed to log on to the network would have to call for assistance.

Jeff Wreyford, a project engineer at Smartmart Inc. in Memphis, said he's confident that smart cards will save him money. He's building a customer service center for a chain of drive-by, unattended convenience stores that will link customers and service representatives via videoconferencing links.

Customer service representatives will use smart cards to enter the building and log on to their Windows 2000 workstations. The cards will record how long each representative stays at his desktop. Wreyford said he believes savings will come from lower support costs and better control of payroll.

Roth said he expects no savings from rolling out digital certificates. "This is going to cost us money," he said. "But what's the price of security?" ▶

Beyond Passwords

Microsoft and Novell are both working to better integrate authentication technologies.

Microsoft:

- Supports digital certificates, smart cards in Windows 2000
- Will support the BAPI in future Windows version
- Promotes widespread smart-card adoption

Novell:

- Offers free tool for administration of third-party authentication tools
- Now shipping NMAS Enterprise Edition for graded authentication ($49 per user)

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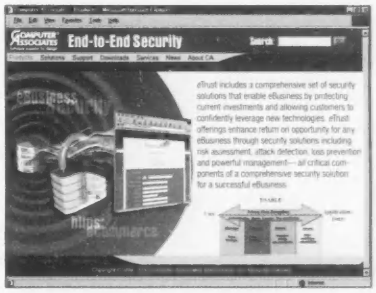

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*According to "Internet Security Software: 1999 Worldwide Markets & Trends," by IDC.

BRIEFS

Motorola Releases Internet Smart Cards

Motorola Inc. in Schaumburg, Ill., announced it has begun shipping an Internet security application that works with its 32-bit M-Smart Jupiter multiapplication smart card based on Java Card 2.1 technology and Visa Open Platform 2.0 standards.

The Flexgate product, which was designed for use with Netscape Communicator, combines PC resident software with a Java card application.

Novell's eDirectory Finds Friends

Two transportation firms will use Novell Inc.'s NDS eDirectory to manage their worldwide networks. The Air Operations division of Memphis-based Federal Express Corp. has rolled out eDirectory to let pilots and crew members access applications from any location

Miami-based Hellmann Worldwide Logistics Inc. will link 368 offices in 125 countries via eDirectory.

SOAP Goes to W3C

Microsoft Corp. has submitted the Simple Object Access Protocol (SOAP) to the World Wide Web Consortium (W3C) as a first step toward turning the specification into a standard. SOAP is a protocol for linking Internet applications running on different platforms using XML messages.

Initially criticized, SOAP is now being backed by IBM, Compaq Computer Corp. and SAP AG.

Pilot Announces SecurEBiz Web Hosting

Alameda, Calif.-based Pilot Network Services Inc. announced last week that it's integrating a trusted operating system environment developed by Savoy, Ill.-based Argus Systems Group Inc. into its Heuristic Defense Infrastructure. The integration will create a new SecurEBiz Web-hosting service through Argus' trusted version of Sun Microsystems Inc.'s Solaris operating system environment.

New Group Tackles Linux Compatibility

Critics say goals may be unattainable

BY DOMINIQUE DECKMYN

THE NEWLY formed Free Standards Group (FSG) will strive to assure binary compatibility of Linux applications running on different distributions of the operating system. It's a quixotic goal at best, some critics say.

Despite dire predictions, Linux hasn't splintered in the same way as Unix. But that doesn't mean applications will run on any version, or distribution, of the operating system. "I've had some troubles," said Gene Christian, technical operations manager at Goldsmith's Inc. in Wichita, Kan. His company has standardized on Red Hat Inc. Linux, but, says Christian, getting the same applications to run on other distributions, such as those from SuSE Linux AG, isn't always easy.

Common problems include files stored in different directories or incompatible versions of key code libraries. "You can usually get it to work if you take your time to do it. But people who are new to Linux often can't," Christian said.

Compatibility Crusade

Dan Quinlan, a software engineer at Santa Clara, Calif.-based Transmeta Corp. and chairman of the FSG, said the group will address such compatibility issues, creating a way for developers and users to guarantee that a compliant application will run on an FSG-blessed operating system. The group combines two existing informal organizations, the Linux Standard Base project and the Linux Internationalization Initiative.

The FSG's first task is to deliver a public draft of the Linux Standard Base (LSB). LSB 1.0 will ensure that compliant applications run on any Linux distribution that supports the standard, Quinlan said.

Most major Linux players have pledged to back FSG, including Red Hat, Caldera Systems Inc., SuSE, Corel Corp. and TurboLinux Inc., as well as software vendors such as SAP AG and IBM.

Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass., said, "If this means that [FSG's supporters] will comply with the standards promulgated by the group, the majority of Linux software will automatically follow the standards."

But that's still a big "if." Michael Tiemann, chief technology officer at Durham, N.C.-based Red Hat, said the ultimate goal of the FSG — to guarantee compatibility between compliant applications and operating systems — is unattainable. He said that despite the LSB specifications and test suite, version differences will linger, and developers will still need to test applications with every Linux distribution, undermining LSB's purpose. Developers will concentrate on testing for the distributions most common in their target market, according to Tiemann.

"If we don't do a good job, we'll be ignored," Quinlan acknowledged.

Christian, for one, said he hopes the FSG will succeed. "I believe this is what the industry needs," he said.

Specs on Deck

The Free Standards Group, a nonprofit corporation, combines the Linux Standard Base (LSB) and the Linux Internationalization Initiative (LI18NUX). The new group:

- Will deliver next month a public draft of the LSB 1.0 spec for binary compatibility between Linux distributions on Intel (other platforms will follow)
- Will deliver final spec and test suite by year's end
- Will include LI18NUX work in future version of spec

Summit Attendees Mull Computer Security Tactics

Talks turn to legislation, more secure software

BY ANN HARRISON
MENLO PARK, CALIF.

Sen. Fred Thompson (R-Tenn.) last week brought his crusade here for legislation that would require the government to review its security practices annually.

Thompson discussed his bill in an address at the Internet Defense Summit, a gathering of some 100 corporate security managers who met with politicians and law enforcement representatives to refine strategies for fighting computer crime.

Attendee Gary White, a security research manager at London-based BP Amoco PLC, said he was pleased to see the large turnout and the presence of government officials at the summit. "It is an indication that IT security is being recognized at high levels in corporations," White said.

Thompson's proposed Government Information Security Act was approved last week by the Senate Government Affairs Committee, of which Thompson is chairman.

Nonetheless, the senator cautioned that the federal government doesn't have the resources to prosecute security suspects. Thompson also said Congress shouldn't pass legislation that forces companies to cooperate with investigations.

"We don't know yet how to run our own shop," Thompson said, adding that companies have to create their own security defense plans. He said the government could assist by providing grants for security research, giving tax breaks to firms that develop security tools, enforcing current laws and increasing the number of visas for high-tech workers, thereby helping to ease the chronic shortage of people trained in security practices.

A few participants called on software firms to make their applications more secure. One suggestion was that default settings in software should automatically be at the highest level of security available.

"You wouldn't build a swimming pool in the center of town and not put a fence around it, and I think that's what the software companies are doing," said Glenn Tenney, a director at Pilot Network Services Inc. in Alameda, Calif., during a luncheon that was open to reporters.

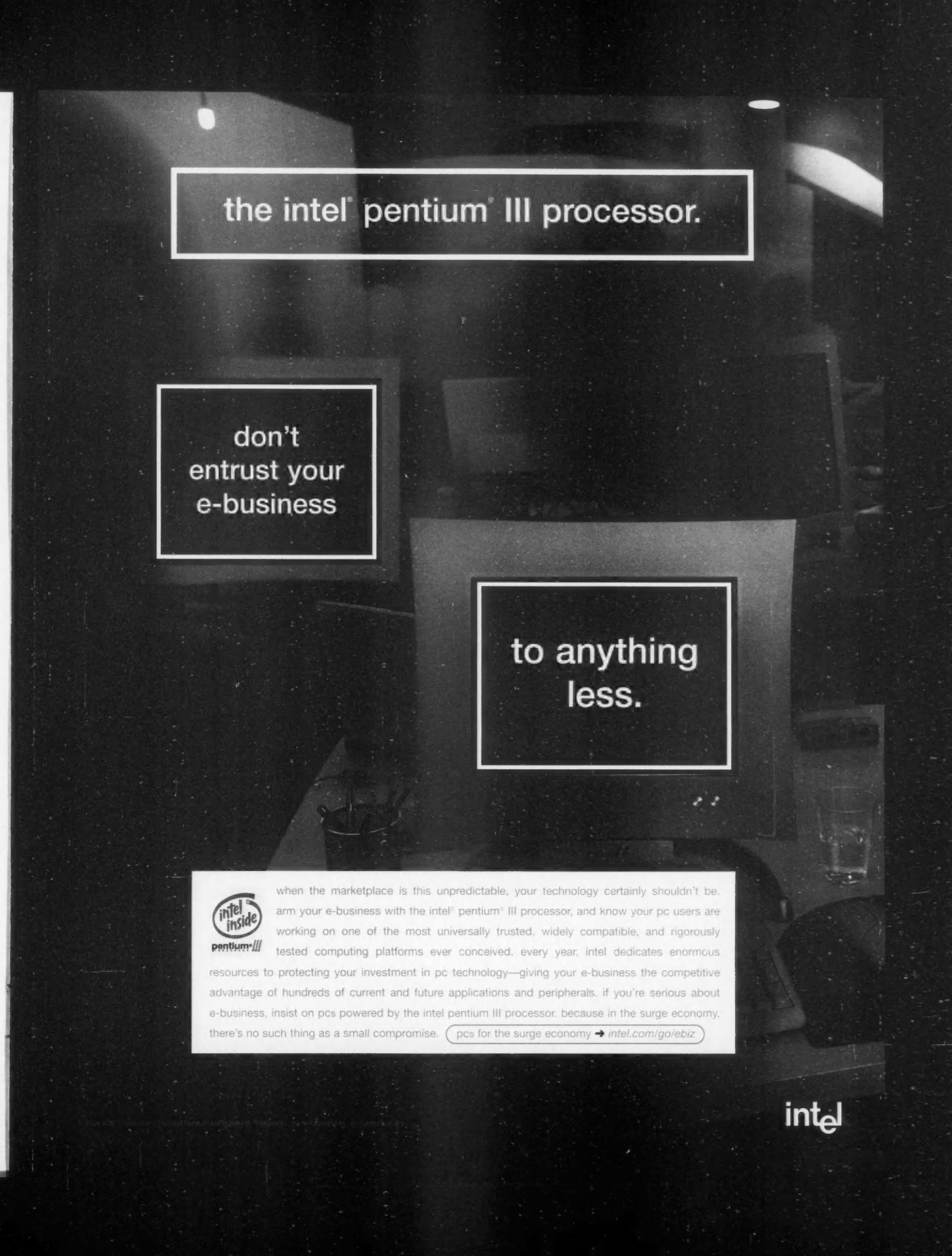
> We don't know yet how to run our own shop.
>
> SEN. FRED THOMPSON (R-TENN.)

Most of the summit took place behind closed doors, in what summit organizers said was an effort to encourage candid discussions about security problems and how attendees have learned to cope.

At the luncheon, Selwyn Gerber, a managing partner at Los Angeles-based offshore investment firm PrimeGlobal LLC, said his company considers the Internet so insecure that it won't use it to transmit sensitive customer data.

"We're back to using faxes, and we find that much more secure," Gerber said. "We [also] use [Federal Express Corp.]. In fact, if there were ponies still traveling across Europe, we'd probably use those, too."

James Niccolai of the IDG News Service contributed to this story.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Flower Shop Chain Picks DSL-Based WAN

BY JENNIFER DiSABATINO

Though it wasn't in time for Mother's Day, a Boston-area chain of flower shops is replacing its dial-up networking connections with a DSL-based wide-area network from a local broadband provider.

KaBloom Ltd. in Woburn, Mass., has arranged to have the WAN up and running next month through Digital Broadband Communications Inc. (DBC) in Waltham, Mass. The WAN will connect 11 of KaBloom's 14 stores in Greater Boston that have Digital Subscriber Line (DSL) access.

The network will allow stores to quickly send their daily information to headquarters and to receive orders immediately from the company's phone center. It will also provide continuous access to e-mail, which is used to send orders from the company's Web site.

KaBloom's information technology manager, David Yashar, said last week that neither the technology nor the configuration is unique, but KaBloom, like many businesses its size, is just looking for a reliable backbone to keep information flowing in real time.

"We're trying to not bite off more than we can do to start," Yashar said.

KaBloom now uses a dial-up connection to process orders by e-mail through the Internet.

"The Internet is not reliable. It would take a while. We didn't have the reliability that things were going back and forth," Yashar said, because each store has to dial in to upload and download order information.

Reliability and Focus

Reliability is one reason KaBloom hired DBC, which will provide the 144K-bit/sec. Symmetrical DSL service, said Yashar. "[Uptime] could be whatever it is, at the end of the day," he said. "What's really important is, how fast are they going to be able to fix it?"

KaBloom headquarters will connect to DBC via a T1 line.

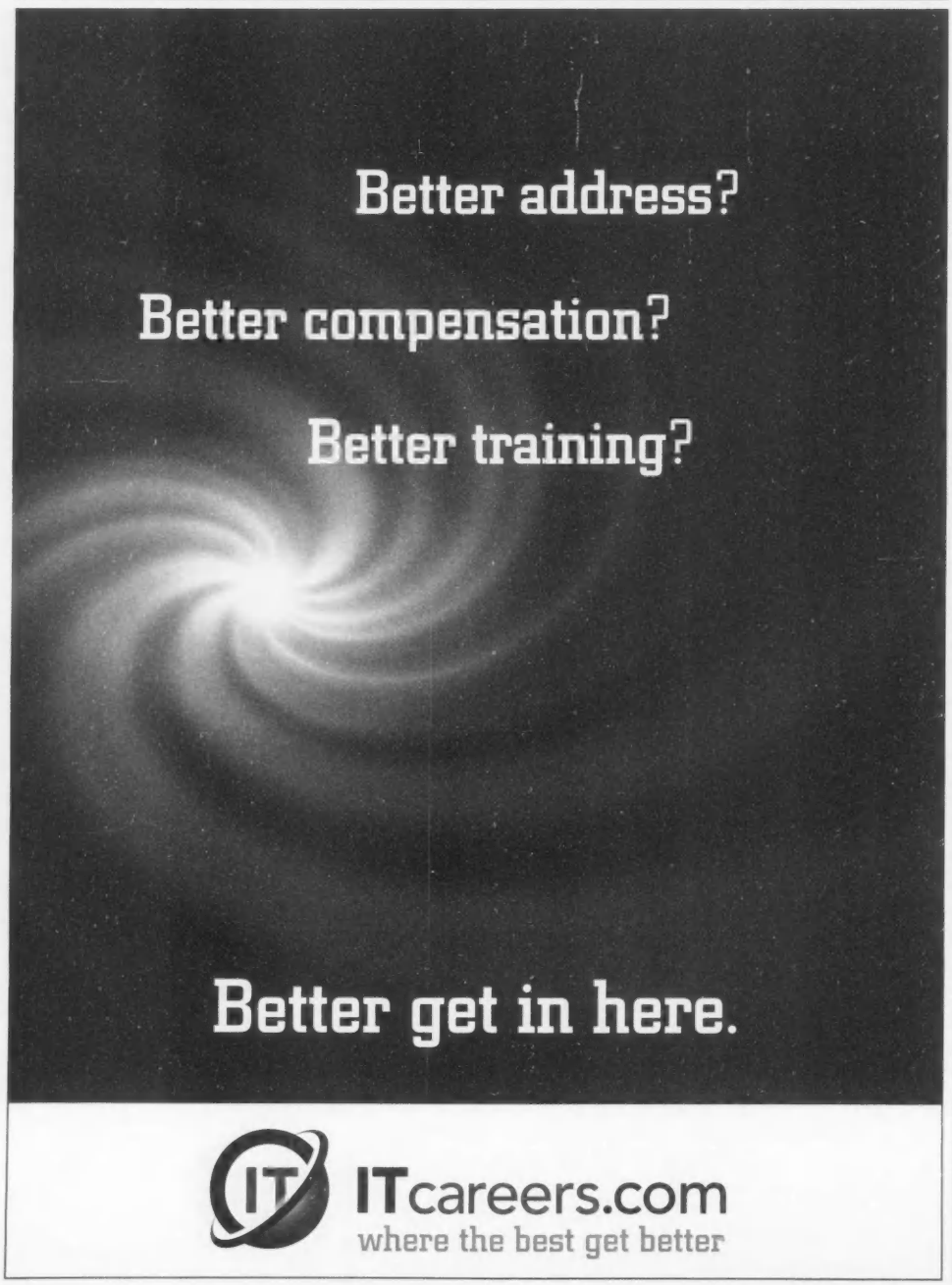
Christine Heckart, an analyst at Tulsa, Okla.-based TeleChoice Inc., said DBC's size and regional focus are what make it attractive to users such as KaBloom.

DBC markets voice, data and Internet services to businesses and large enterprises via its facilities-based Digital Broadband Communications Network and Asynchronous Transfer Mode-based network backbone.

The regional focus was an important factor, Yashar said, because DBC is focused on New England, and KaBloom is looking to expand in that area.

That regional niche is also a plus for DBC in pricing, according to Heckart

"This kind of network almost anyone can do," said Heckart. But DBC is just small enough to set up regional networks and avoid the regulations that govern telephone companies, she added.



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ChoiceParts Venture to Create Virtual Auto Parts Warehouse

New exchange would serve huge demand, but analysts question connectivity

BY LEE COPELAND

CHOICEPARTS LLC, a newly formed business-to-business parts exchange, is steering toward a market of 74,000 automobile dealers and repair shops that seems to have an inexhaustible demand for parts.

Denver-based ChoiceParts plans to maintain a virtual warehouse of auto parts, allowing participating dealers and repair shops to locate parts online and generate transaction invoices to speed up the parts delivery process. The company hopes to launch the Internet-based exchange in August or September.

ChoiceParts will boast a substantial customer base when it launches, courtesy of the three companies that founded it.

The three firms, which contributed undisclosed equity stakes to get the start-up rolling, are Dayton, Ohio-based Reynolds & Reynolds Co., a provider of information management systems to car dealers; Automatic Data Processing Inc. (ADP), a transaction processing firm in Roseland, N.J.; and CCC Information Services Inc., a claims processing firm in Chicago.

Reynolds & Reynolds and ADP estimate that their customers in the automotive industry conduct more than 47 million parts location searches per year. Reynolds & Reynolds plans to turn over the technology and business development assets of its OneTouch eParts Network, launched last August, to ChoiceParts.

Large Procurement Market

ChoiceParts officials estimate that auto dealers and collision repair shops spend a total of $14 billion to $16 billion annually to procure parts.

While the potential market is sizeable, the execution may require overcoming some tactical obstacles, such as a lack of Internet connectivity in some segments of the automotive market that aren't particularly tech-savvy.

Laurie Orlov, an analyst at Forrester Research Inc. in Cambridge, Mass., said collision shops constitute an underserved market segment. But she questioned whether ChoiceParts is prepared to tackle the connectivity issues associated with getting these body shop businesses online. Unless ChoiceParts pays to get those shops connected, the opportunity will be a relatively narrow one, Orlov said.

"Collision shops just don't have the kind of connectivity in place to stay up all the time," she said.

ChoiceParts has no plans to offer connectivity to dealers and repair shops. Tom Baird, the exchange's chief operating officer, said 80% of the dealers it's initially targeting — a base of 19,000 existing Reynolds & Reynolds and ADP customers — have access to the Internet. ◗

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Three's a Crowd

ChoiceParts will face competition from these online rivals:

Newco, announced in February by General Motors Corp., Ford Motor Co. and DaimlerChrysler AG, will offer a core materials procurement system for major auto manufacturers and an automotive parts exchange for dealers.

Business to Business Commerce Network Inc. in Houston (*www.BBCN.com*) sells office supplies, specialized vehicle equipment, car accessories and parts via the Web to auto dealers.

PartsDriver.com Inc. in Brookline, Mass., offers an aftermarket auto parts trading exchange in three formats: catalog-style listings, auctions and "parts wanted" postings targeted at dealers and collision repair shops.

America West Enables Online Hotel, Rental Car Booking

Services added to plane ticket sales

BY MICHAEL MEEHAN

The breakneck pace of technological innovation in the airline industry continued last week as America West Airlines Inc. unveiled a new home page that allows customers to book hotel rooms and rental cars when they buy plane tickets online.

Meanwhile, St. Paul, Minn.-based Northwest Airlines Inc. signed a $5 million deal with BEA Systems Inc. in San Jose to provide technology that should ultimately eliminate the green-screen terminals used by its booking agents.

Airlines have recently begun to add to their Web sites the capability to make hotel and other types of reservations. Forerunners in this space include United Air Lines Inc. and Travelocity.com, analysts said.

Bernie Han, vice president for planning at America West, said the airline has more than 100 information technology projects on tap. He declined to specify how much the Tempe, Ariz.-based company invested in its recent site upgrade.

"It seems the bar rises every day, and it's been accelerating in recent months," he said.

The new Web page also allows customers to create user profiles that will prevent them from having to repeatedly enter name, address and credit-card information to book America West flights.

The airline will then use the information to create customer profiles. "We're just starting to get a better understanding of who our customers are," Han said. "It's a powerful tool that we're just starting to utilize."

According to Han, America West plans to update its proprietary database to present information in a more user-friendly manner.

Changing Terminals

Meanwhile, the Northwest/BEA deal will enable the airline to replace the traditional Westinghouse reservations terminals used by Northwest agents with browser terminals.

Jeremy Schneider, the company's manager of middleware services, said the BEA Tuxedo product will also be used as a messaging tool between the airline's legacy systems and its newer technology. "It helps get information through our firewall to our back-end system," Schneider said. He added that Northwest has systems dating back to the 1960s.

"We operate in a very mature Unisys environment. We have some functions that still use [IBM's Transaction Processing Facility operating system], and we use WorldSpan as our reservations system, and none of it speaks to the other stuff," Schneider said. "There's a whole lot of linking going on." ◗

Glass Ceiling for Women in IT Persists

BY JENNIFER DiSABATINO

A government report released last week says women continue to be relatively underpaid and underrepresented in the information technology workforce.

According to the report, released by the president's Council of Economic Advisors (CEA), women comprise 47% of the general workforce, but only 29% of IT jobs are held by women. And there is a pay disparity that is particularly acute at the high end of the scale.

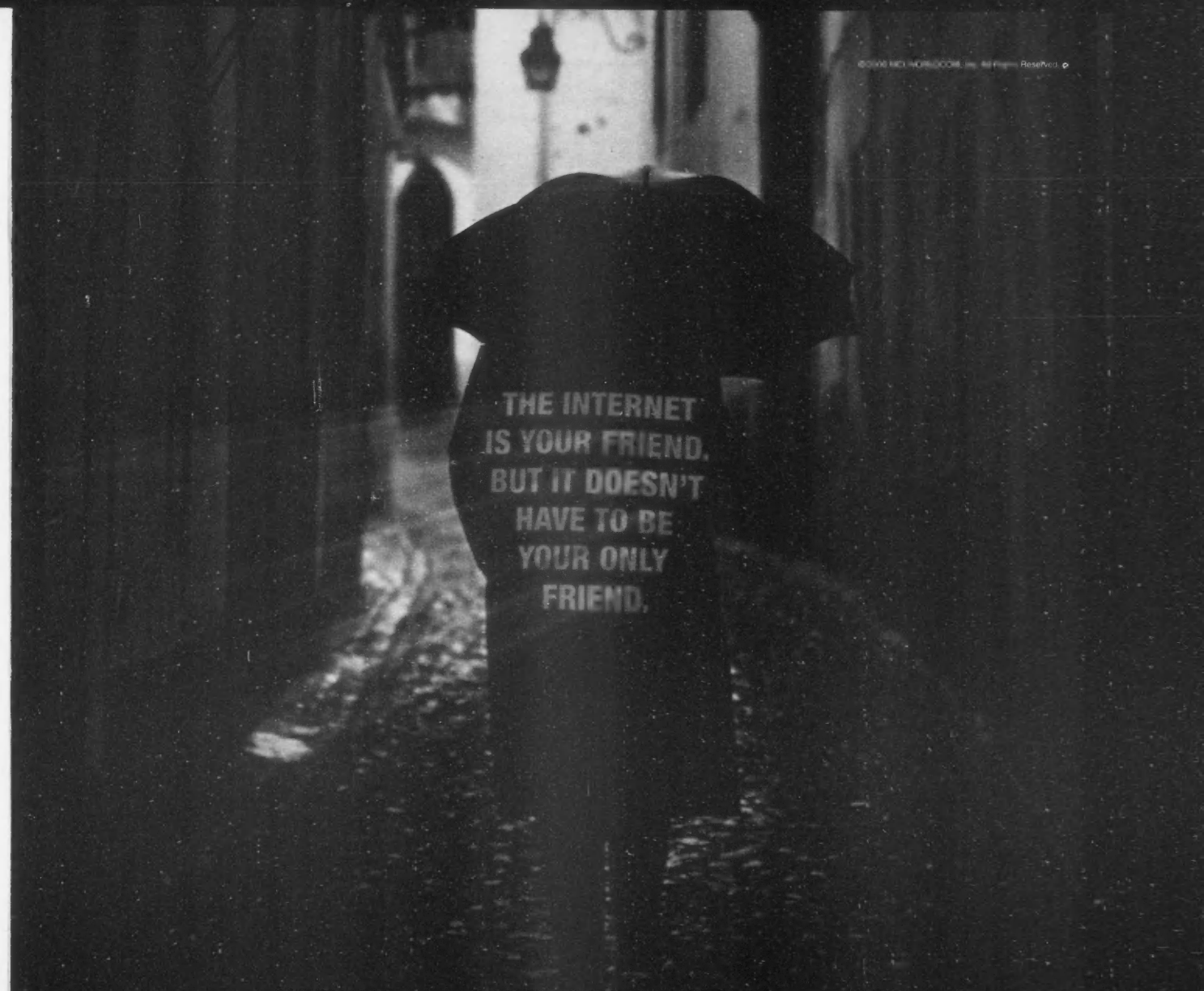
Using nationwide figures from the U.S. Census Bureau, the CEA compared the jobs and salaries of women with those of men in IT, then adjusted the data to account for factors such as race, age, hours worked and education.

The report concluded that there is a pay gap in hourly compensation of 22% in favor of men, or 17% when adjusted for the other factors. Moreover, "women are most underrepresented in the IT occupations where pay is the highest," the report says. In electrical engineering, for example, only 10% of the workforce is female.

That creates an "occupational disparity [that] contributes to a lack of women in the highest paid jobs. While 18% of men employed in IT earn $70,000 or more, only 8% of women earn this much," according to the report.

There is also a gender disparity among executives at start-ups. Reports from private groups that have studied women in IT said this may partly be due to the fact that start-ups rely on the male-dominated venture capitalist field for board members.

Still, there's some good news. IT jobs, in general, pay women well above the median income for women in non-IT jobs. Women in full-time IT positions earn a median income of more than $38,000. That's 60% higher than the median income for women working outside IT, which is $23,900, according to the report. ◗



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Oracle Users Wary of Its Web-Based Support Plan

Bid to cut support costs may clash with user need to access human support

BY CHRISTINE McGEEVER
ANAHEIM, CALIF.

ORACLE CORP. is moving its technical support services to the Web, but customers are skeptical that the change will do them good.

Attendees at the International Oracle Users Group – Americas meeting here last week told Oracle support services executives that they don't want their phone privileges taken away.

"I'm reluctant to use [the online system]," said Jerry Webb, Oracle support project manager for the computer operations division at Deere & Co. in Moline, Ill. "With the phone, at least I get to talk to somebody, even after being put on hold."

Oracle has a big incentive to move support onto the Web. It has attributed a $1 billion cost reduction for last year to the use of its own e-commerce applications companywide — a feat it would like to repeat.

For about a year, Oracle has offered Metalink, an online system that lets users contact customer support analysts and access technical documents.

Attendees said Metalink isn't as effective as voice-to-voice contact with Oracle technical analysts, even though callers are often left on hold for long stretches. Skeptical users also complained of frequent downtime with the current system.

According to Oracle support services senior manager Dave Muirhead, a second server has been purchased and will be configured to mirror the existing server to eliminate downtime altogether.

And in keeping with the companywide campaign to do business on the Web, Metalink will be bolstered by the addition of Oracle's own electronic customer relationship management (ECRM) applications.

The ECRM technology will boost the system's ability to maintain searchable documents and handle greater traffic, according to Oracle. The upgrade is scheduled to begin in November and will continue incrementally through the rest of the year. Once it's in place, users will need to go online first to initiate a service request, rather than go to the phone.

User should gain a higher success rate, faster resolution and a richer, centralized database of support information, according to Oracle.

Mark Graham, database administrator and webmaster at Compaq Computer Corp.'s professional services division in Houston, said he was concerned about how assistance-request routing will be prioritized under the new system.

"Some junior [database administrators] will have high-profile problems," he said, and will need contact with experienced analysts rather than equally junior support staff.

Terry Palanca, an analyst at Giga Information Group Inc. in Cambridge, Mass., said other firms have tried to apply self-serve aspects to customer support, with mixed success. "A level of self-service is great for known issues, but undocumented, unique problems cannot be solved in a self-service environment," she said.

Muirhead acknowledged that users' trepidation was reasonable but asked that they be patient during the transition.

Going Online

According to Oracle, Web-based customer support:

Won't result in layoffs among the 6,000 support service employees worldwide.

Won't change the current pricing structure for licensed customers.

Continued from page 1

H-1B Visas

employment. But many employers are under increasing pressure to find any means of hiring technical talent. The nation's unemployment rate hit a 30-year low last month of 3.9%. Moreover, as many as 800,000 high-tech positions will go unfilled over the next 12 months, according to a recent study from the Information Technology Association of America.

The labor shortage extends to international workers. Employers exhausted the H-1B limits by March 21, and many are pinning their hopes on pending legislation that would lift the H-1B visa cap.

The H-1B quota is set at 115,000 for the federal government's current fiscal year, which ends Sept. 30, and 107,000 for fiscal 2001. More than half of these visas are granted to systems analysts and programmers, according to the Immigration and Naturalization Service (INS).

Two pending bills seek to raise the cap to roughly 200,000 over the next three years, while one proposes lifting the cap altogether. Though most observers expect a law to raise the H-1B cap, not everyone thinks the government will do so this fiscal year.

Like many employers, KPMG Consulting Inc. in New York relies on the H-1B visa to bridge its labor shortage by enabling foreign workers with technology skills to work in the U.S. for up to six years. The company filed 150 H-1B petitions this year on behalf of technical consultants with systems integration skills, said Sean Huurman, the firm's national director for recruiting.

In April, soon after the INS stopped accepting new H-1B petitions for this year, the company recruited three additional foreign nationals, said Huurman. But these employees work in their native countries, so they don't require visas.

KPMG may file for H-1B visas on behalf of these employees in October, when the INS begins accepting new petitions for fiscal 2001. Alternatively, the company can apply for L-1, or transfer, visas down the road. The cap-free L-1 visa allows multinationals to transfer overseas employees to work in the U.S., but only after they have worked for the company for at least one year.

The L-1 visa option is no panacea. Huurman said it's costly for a U.S.-based firm to hire a foreign worker based overseas. The foreign employee is taxed both in his native country and in the U.S., and the employer winds up paying the U.S. taxes, he said. "It's not a Band-Aid we plan on using more of," he said. KPMG has used this option only to obtain specialized skills in areas such as Internet integration, SAP and telecommunications billing.

Another possibility is to recruit H-1B visa holders already employed at other U.S. firms. Because they already work in the U.S., they aren't counted against the H-1B quota, said Liz Stern, an immigration attorney at Shaw Pittman in Washington. H-1B visa holders don't have to stay with the company that brought them over.

But trolling for existing H-1B visa holders can be tricky, and it's not a quick solution. If companies try to recruit another employer's H-1B visa holder, the worker must remain at his original employer until the government approves his new application so there are "no lapses in work authorized status," Stern said. Processing these transfers typically takes two to three months.

Under another option, Stern said, the North American Free Trade Agreement (NAFTA) lets employers hire systems analysts, engineers and management consultants from Canada or Mexico to work in the U.S. for up to one year under Trade NAFTA, or TN, status.

That appealed to Austin, Texas-based consulting firm Catapult Systems Corp., which hired about half a dozen Canadian workers under TN status.

But CEO Sam Goodner warned that even if employers have filed the necessary paperwork, TN status may still be denied at the border. "We've had several of our workers denied at one border crossing, and they had to drive several hundred miles to [another]. It's never really a sure thing until they're across," he said.

"Unfortunately, this happens quite a lot," said Los attorney Carl Shusterman, adding that TN-status employees should never say at the border crossing that they have been offered permanent employment.

But some employers see only one realistic alternative to H-1B: luring domestic IT workers who already have jobs. "Everyone is forced to raid other companies for their talent," said Phillip Merrick, CEO of Fairfax, Va.-based WebMethods Inc. "It's not terribly productive for the economy as a whole."

Alternatives to H-1B Visas

Trade NAFTA (TN)
For Canadians and Mexicans; allows systems analysts, engineers and management consultants to work in U.S. for up to one year

L-1, or transfer, visa
For foreign-based workers employed with a U.S. company for at least one year; allows them to stay five to seven years

O-1 visa
For people in all occupations who are at the "pinnacle of their fields" and demonstrate expertise in a niche specialty; allows them to stay three years but can be renewed indefinitely

SOURCE: LIZ STERN, ATTORNEY AT SHAW PITTMAN, WASHINGTON

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For resources related to immigration laws, such as FAQs and forums, visit our Web site.
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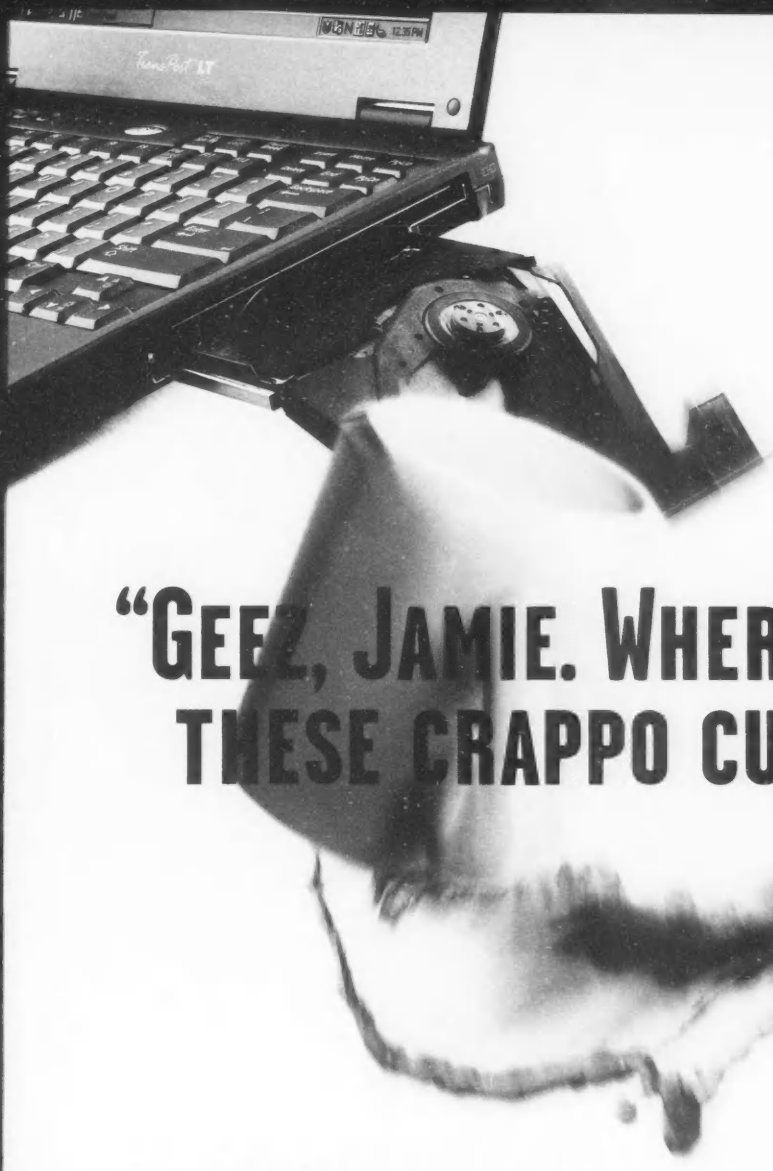

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pentium III

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Continued from page 1

B-to-B XML

to meet a June 6 deadline.

Arrow Electronics Inc. in Melville, N.Y., for instance, expects to eventually make a full conversion to transactions based on XML, but right now it's in production with just one trading partner. Cisco Systems Inc. in San Jose is up and running with two distributors. Santa Clara, Calif.-based 3Com Corp. is just finishing up its first trading-partner implementation. Some firms haven't completed any yet.

"It certainly is harder work than people anticipated," said Jennifer Hamilton, president and CEO of RosettaNet, noting that five is the highest number of implemented trading partnerships for one firm she is aware of. "It's pretty easy to slap up a Web site and do computer trading. But when you're actually developing B-to-B connectivity with your trading partners, that's a more challenging undertaking."

And it takes time.

Selectron Corp., a Milpitas, Calif.-based manufacturer of computer products and components, began discussions with one trading partner at the beginning of the year and just went into production earlier this month. Four other implementations that are in the pipeline should go more quickly, taking two to three months apiece, said Ken Ouchi, corporate vice president of strategic transformation at Selectron.

On the technology side, Selectron had to make sure its Extricity Inc. server properly extracted the data from XML forms for translation and mapping to its Baan Co. enterprise resource planning system, Ouchi said.

The Battle for Hearts and Minds

But technology was only half the battle. "Getting the hearts and minds" of the engineering and materials organizations, IT staffs and executive management teams can be a greater challenge, Ouchi said. "This stuff is tough. It is absolutely tough. And it isn't the technology that's tough," he said, predicting it could be 18 months before RosettaNet members show "good economic results."

Back-end integration and business-process challenges drove 3Com to hire Viacore Inc. to help with implementation. The Orange, Calif.-based company, which was co-founded by former RosettaNet CEO Fadi Chehade, will help 3Com link with other trading partners and route transactions between them, said William Coker, Viacore's manager of business-to-business e-commerce.

"That takes away the need for a company like 3Com to engage each one of our trading partners for point-to-point integration," Coker said. "It will cut down the cost of our implementation and rollout."

While that should help escalate adoption, Coker said he recognizes that the deep cultural and business-process changes needed to make RosettaNet flourish could take a few years. "You've got to get your companies behind it and embracing your strategies," he said, noting that 3Com will try to link with a handful of key strategic partners — not "everybody and anybody."

NEC Technologies Inc. in Itasca, Ill., hasn't been able to hook up with any RosettaNet members yet. It's in development with two firms: Tech Data Corp. in Clearwater, Fla., and Ingram Micro Inc. in Santa Ana, Calif. "As a manufacturer, [we find] most of the companies we want to do business with are still focusing on their customer side," said Kim Flowers, NEC's vice president of strategic systems and technology.

Flowers also noted the work involved in complying with RosettaNet standards. For instance, manufacturers must switch to Global Trade Identification Numbers (GTIN), universal codes for identifying their parts. "If you've got hundreds of thousands of parts that have to be identified with a GTIN number, that's a daunting task for many companies," she said.

RosettaNet standards, called Partner Interface Processes (PIP), also aim high. XML-based PIPs go beyond merely defining data formats to describing entire business processes such as the many transactions involved in purchase order management.

But despite the many challenges, RosettaNet members are convinced that their efforts will pay off. Hamilton said one company expects a $10 million return from implementing the price-protection PIP alone.

Several analysts said that while the standards progress has been impressive, it's too early to tell whether RosettaNet will ultimately be successful.

"It all sounds really good," said Kim Knickle, an analyst at Boston-based AMR Research Inc. "But until you start talking to people who have really used it, you don't find where all the catches are."

MOREONLINE

For more resources, such as articles, specifications and papers related to XML, visit our Web site.
www.computerworld.com/more

Continued from page 1

Wireless App

the first in a series of new business-to-business offerings from Galileo. Rosemont, Ill.-based Galileo is converting much of its legacy reservation system to XML-based software components that can be downloaded and incorporated into other companies' applications.

"Our vision for Galileo is to open up all the functionality and data housed in the system to everyone and anyone who wants access to travel information," said Jim Lubinski, executive vice president of operations at the company, which today serves more than 40,000 travel agencies.

Galileo is working with Schaumburg, Ill.-based Motorola Inc. to develop a similar application for users of Motorola's wireless two-way pagers. AT&T Corp. has also expressed interest in developing a service, Lubinski said.

About 800 Sprint users with Wireless Application Protocol-ready cell phones have been using the service since February. Before that, Galileo software developers spent close to a year working with developers from Dallas-based ObjectSpace Inc. Galileo has applied ObjectSpace's OpenBusiness software tools to extract information from multiple legacy systems. With XML-based modeling techniques, Galileo then converts the data into components its business partners can drag and drop into their own software.

"We've built a wireless server that is the conduit between pervasive computing devices that access the data and the legacy system itself," Lubinski said. "We've designed this initial effort to encapsulate all of the travel services Galileo offers."

Galileo considers the new business-to-business electronic services and partnerships a "huge revenue opportunity," Lubinski said.

For example, Lubinski said, he expects corporate in-house travel systems to adopt the technology. He declined to give an exact figure of projected revenue growth.

"What Galileo is doing represents the real business value of XML," said Tyler McDaniel, an analyst at Hurwitz Group Inc. in Framingham, Mass. For the past year or so, companies have largely deployed XML-based applications to cut costs by improving data access and exchange among supply-chain partners. "It's just now that companies are creating new revenue streams," McDaniel said.

But fair warning: Getting there is a complex undertaking, according to John Mann, an analyst at Seybold Group Inc. in Boston. "All of these legacy applications were never meant to work in the Web world," Mann noted. Transforming them into "nice, neat objects involves a lot of design work. It's not just that you get a tool or push a button."

But Mann also predicted that vendors such as ObjectSpace "will eventually be able to dumb these things down so the average Joe can do it."

Intel Offers Appliances to Speed XML

BY JAMES COPE
LAS VEGAS

Intel Corp.'s new XML Web-acceleration and traffic-control devices are helping to boost transaction speeds and eliminate error messages sent to users, according to Mark Pipin, manager of Web development at Christianbook.com, a unit of Christian Book Distributors Inc. in Peabody, Mass. Pipin has been testing the appliance, which Intel introduced last week.

Intel said its NetStructure 7210 XML Accelerator will speed transaction processing on e-commerce sites by offloading XML decryption functions often performed by Web servers.

The 7280 XML Director, a companion to the accelerator, looks at transaction-specific information carried by the XML tag and validates that information with an e-commerce server to process an order. Intel said the device distinguishes among different "dialects" of XML, and it uses that information to route data to the most appropriate server.

Should the server reject the validation request due to a processing error, the Intel device repeats the request to the server instead of sending an error message back to the user's screen.

Intel said the XML network appliances will begin shipping in July. Pricing for the products wasn't immediately available.

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David Warthen, Chief Technology Officer, **Ask Jeeves**

"One of our biggest challenges was to take something that's really hard to build – natural language Web querying – and disguise the complexities to make it easy to use."

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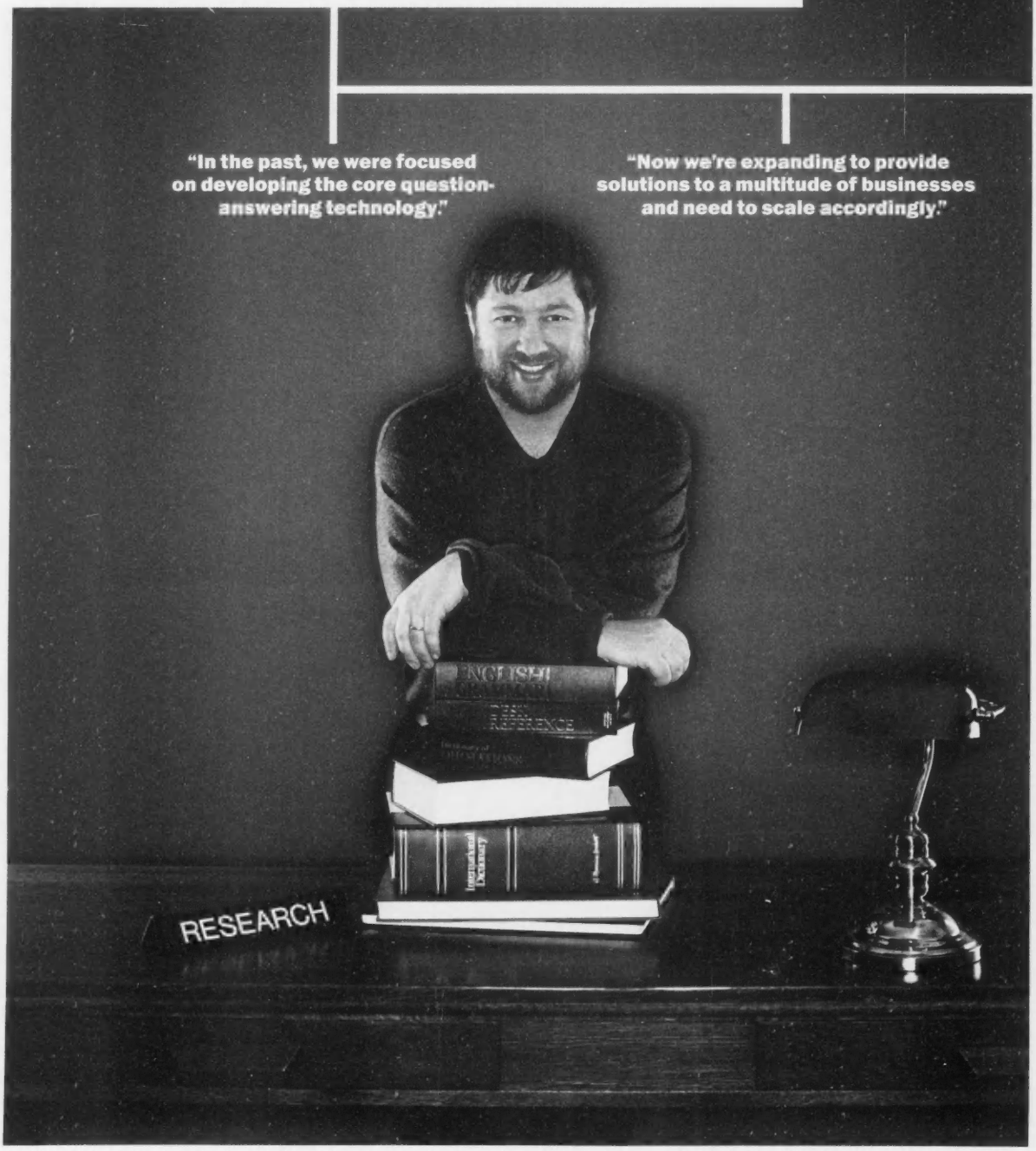
"Now we're expanding to provide solutions to a multitude of businesses and need to scale accordingly."



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The Business Internet

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Wells Fargo Rolls Out Internet-Enabled ATMs

Full-motion video will occupy some customers while they wait for cash

BY ANN HARRISON AND MARIA TROMBLY

THE PERSON waiting in line behind you may not be entirely pleased, but Wells Fargo & Co. has recast the automated teller machines (ATM) at some of its banks as "street-corner portals to online information."

San Francisco-based Wells Fargo said its ATMs have been Web-enabled to offer not just cash, banking transactions and stamps, but also headline news and full-motion video.

Some analysts were concerned about the potential for traffic problems.

"These are things that will cause people to be at ATMs for a longer period of time," said George Barto, an analyst at Gartner Group Inc. in Stamford, Conn. "People who just want cash may be backed up, so I'm not sure of the great value of it from that perspective."

Richard Bell, director of Internet banking for Tower-Group in Needham, Mass., echoed that concern but said that with care, a financial institution could ameliorate it.

Boon for Customers

"Adding more ATMs is certainly one possibility," he said. "Changing the functionality based on time of day and ATM usage levels is another."

Overall, Bell said, Web-enabling the ATMs should help customers.

"For example, if I previously interacted with an institution through their call center over an issue and I went to an ATM the next day and they had resolved that issue, telling me about it on the ATM saves me a phone call, saves them a phone call," he said. "It's better service."

Even ads such as movie trailers or event promotions may serve a need, Bell said, if the institution knows that a particular event is of interest to that particular customer.

"Do you enjoy looking at 15 seconds of dead screen, or would you enjoy looking at 15 seconds of movie trailer?" he said. "It happens that I enjoy contemporary and modern dance. Say I'm going up to get some cash and the ATM says, 'Hey, did you know that the Joffrey Ballet is coming to town and I can get you a great ticket right now. Are you interested?' Of course, I would be."

> These are things that will cause people to be at ATMs for a longer period of time.
>
> GEORGE BARTO, ANALYST, GARTNER GROUP INC.

Wells Fargo unveiled the ATMs two weeks ago in San Francisco and Los Angeles. More than 800 of the machines are scheduled to be available this year in California and Arizona, with the rollout continuing next year.

At the ATM

Customers approaching the new ATMs will view full-motion movie previews or entertainment, Wells Fargo said. After inserting their ATM cards, users will receive a personalized greeting message plus MSNBC.com headlines at the bottom of the screen.

Transactions are selected using touch-screen, drop-down menus. A sidebar menu option will give customers a link to a full Web screen and more detailed product offerings from Wells Fargo, the bank said.

Linda Altan, an analyst at Gartner Group, said the Web capabilities are in use elsewhere and don't have to cause traffic problems.

"This is very widespread in England and very often in various locations they may have three ATMs — one for deposits, one for cash, and one for some of these other activities," she said.

More Than Money

Movie trailers are just the latest in a line of noncash ATM offerings at Wells Fargo.

1994
Wells Fargo becomes the first major bank to dispense U.S. postage stamps

1997
Discounted ski lift ticket vouchers become available

1999
Discount entertainment park vouchers available at some ATMs

SOURCE: WELLS FARGO & CO.

Firms Tackle Compensation With Software

Applications can ease difficult process

BY JULEKHA DASH

As companies increasingly offer stock options and other nonsalary incentives to attract and retain skilled employees, they're faced with the complex task of distributing the options and effectively managing diverse benefits packages. Some companies are finding that software can help manage the process.

Marc Ketzel, vice president of global human resources at @Home Corp. in Redwood City, Calif., recently began using software to manage employee salary and stock plans. Managers at @Home now use TotalComp Manager from Kadiri Inc. in Burlingame, Calif., under an application service provider model.

Because it is acquiring five to 10 firms per year, @Home — which provides broadband online services to consumers and businesses under the brand name Excite@Home — decided it needed an application more sophisticated than a spreadsheet to manage compensation for new and existing employees, said Ketzel.

Incentive Plan

Ways to manage employee compensation:

1) Hire an outside contractor or full-time specialist to determine compensation plans

2) Use a software package to determine reward structure

3) Establish pay-for-performance goals and track employees' progress

When it used spreadsheets, @Home had to send compensation reports via diskettes or e-mail to geographically dispersed managers, making it difficult to maintain a consistent report format, Ketzel said. He added that using a Web-based application will make it easier for managers to make salary or stock recommendations.

Software Features

By receiving data feeds from Pleasanton, Calif.-based PeopleSoft Inc.'s human resources application and the company's stock administration database, TotalComp Manager allows managers to determine which stock options have been granted and at what price and to ascertain what portion has been vested.

The software also graphically depicts how a pay increase would affect a manager's budget and compare, say, an engineer's salary with those of his peers within the company or elsewhere within the industry, said Ketzel.

In the past, companies offering stock options have typically made them available to executives who could afford the services of a tax or financial adviser, said Jerry Inglert, vice president of human resources at E.spire Communications Inc., an information technology services firm in Herndon, Va., that offers stock options to every employee. As more companies distribute options to employees universally, managers are being left with the task of explaining to employees when their options are vested and what the tax implications are, said Inglert.

E.spire will be a beta-test site for OptionWealth, an application from Rockville, Md.-based OptionWealth Inc. The application will save managers time by answering basic questions about the company's stock option plan, Inglert said.

Rising Numbers

According to the American Compensation Association in Scottsdale, Ariz., 47% of employers offered stock programs to salaried employees last year, compared with 39% in 1998.

In addition to salary and stock options, companies are offering such incentives as bonuses, performance-based merit awards and extra vacation time.

"Having been a manager of upwards of 50 people, I know it's difficult to model compensation," said John Hagerty, a vice president at Boston-based AMR Research Inc.

Most companies manage between 50 and 70 compensation plans, but some manage hundreds of plans, said Katherine Jones, a research director at Boston-based Aberdeen Group Inc.

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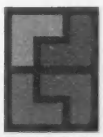

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Sprint Introduces Fixed Wireless Service

WinStar also wins more broadband spectrum at FCC's 39-GHz auction

BY BOB BREWIN

SPRINT CORP. launched a broadband fixed wireless service last week, making the firm the last of the Big Three national carriers to take to the airwaves in order to provide broadband end-to-end service without using local telephone companies.

Fixed wireless customers get their "last-mile" connections through the installation of small rooftop antennas that use the airwaves to link into a long-distance carrier or an Internet service provider. According to David Hawley, an analyst at The Yankee Group in Boston, the setup allows for a speedier hookup compared with waiting for the local phone company to install a wired high-speed line.

For Salt River Sand and Rock in Phoenix, an early user of the over-the-air connections offered by Sprint, the wireless service provided something the local phone company, Denver-based US West Inc., couldn't deliver — a data link from remote sand and rock quarries.

Leaping the Digital Divide

Mark Elzey, director of information management at Salt River, said that until Sprint came along with its fixed wireless service, the company operated on the less-fortunate side of the so-called "digital divide," because there were no phone lines to the remote sites and no way to transmit data back to the company's offices.

A US West spokesman explained that service from his company could be lacking because the territory where Salt River operates is so rural, it hasn't been assigned by US West as a service area for Arizona. He acknowledged that the cost to the customer of extending a phone line to such a remote area would be prohibitively high.

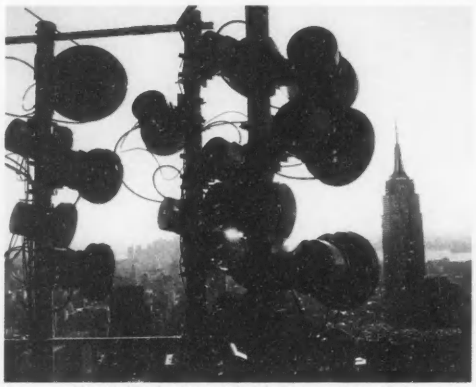
Sprint currently offers its Sprint Broadband DirectSM service only in Phoenix but expects to add between 10 and 15 major markets this year. Sprint priced its business fixed wireless service — which provides a 1M to 2M bit/sec. connection (with burst speeds up to 5M bit/sec.) — at $89.85 per month with five IP addresses. More IP addresses can be obtained for an additional charge, Sprint said.

In a related development, WinStar Communications Inc., a fixed wireless company in New York, sharply increased its portfolio of fixed wireless circuits as the top bidder in the Federal Communications Commission's 39-GHz spectrum auction.

The FCC awarded 2,173 new fixed wireless licenses nationwide in last week's 39-GHz auction, which took in a total of $410 million. FCC Chairman William Kennard hailed the potential of fixed wireless to create "robust competition" for local phone companies.

WinStar led a field of 35 bidders, paying $161 million for 931 licenses in 60 top U.S. markets.

Hawley called the 39-GHz spectrum a "sweet spot" that can provide service at T1 (1.544M bit/sec.) speeds and faster.



Antennae, like this WinStar hub site in Manhattan, allow wireless services to cross the "last mile" between long-distance carriers and users

U.S. Prepares for Spectrum Battle With EU

Mobile and GPS bands up for grabs

BY BOB BREWIN

The 180 member nations of the Geneva-based International Telecommunications Union (ITU) last week started a monthlong conference in Istanbul to carve up portions of the radio frequency spectrum. The U.S. and countries of the European Union are sharply divided on several key issues, including designation of the expansion bandwidth needed to support next-generation, wideband mobile wireless services.

The U.S. delegation to the ITU World Radio Conference (WRC) also anticipates that it will have to defend the spectrum required for new civil frequencies in the Global Positioning System from incursions by the Galileo satellite navigation system, which is in the early stages of development by the EU. Mobile satellite system operators would like to use the same spectrum for global wireless service.

While the EU and its red-hot mobile communications suppliers want to reach a resolution on allocation of new spectrum at the WRC, the U.S. delegation would prefer "to kick the can down the road," according to an anonymous delegation member.

"Our position is that we would like to study the issues — and proposed spectrum allocations — for a while," said the U.S. delegation member, adding that such a study should take "a year or two."

The Personal Communications Industry Association would like the U.S. to leave the conference with an agreement on future spectrum divisions, according to Harold Salters, director of government relations at the Alexandria, Va.-based trade group.

"Any substantial delay would hurt the competitiveness of the U.S. third-generation [wireless] market," Salters said. "If there's not agreement, the U.S. and the rest of the world could end up on different bands."

That could lead to a continuation of the problem that exists today for U.S. cell phone users, who often find they can't use their phones abroad, he added.

The battle for the invisible but valuable real estate also finds the supposedly unified U.S. delegation differing on whether a key portion of the spectrum currently used by fixed wireless operators in the U.S. — the 2,500-MHz to 2,690-MHz band — should be opened up to mobile users.

"The Europeans really want that band badly for next-generation mobile services," a U.S. delegate said.

MCI WorldCom Inc. and Sprint Corp. in Kansas City, Mo., have both spent millions of dollars acquiring licenses in that band and plan to spend millions more to install the systems to operate in it.

A Pentagon official familiar with spectrum issues said the U.S. Department of Defense has tacitly backed the opening of discussions to allow mobile operations in the current U.S. fixed wireless band because its leadership believes spectrum expansion shouldn't always come at its expense.

Andrew Kreig, president of the Wireless Communications Association in Washington, which represents fixed wireless carriers, said, "Our tilt at the ITU conference is toward preserving fixed wireless capabilities in that band. It is extremely difficult to have mobile and fixed operations share the same band, in the same country."

Bob Egan, vice president and research director for mobile and wireless at Gartner Group Inc. in Stamford, Conn., said if the EU designates the 2,500-MHz to 2,690-MHz range as a mobile wireless band and the U.S. decides to retain it as a fixed wireless band, that could drive up costs for the U.S. fixed wireless operators, as manufacturers will be producing equipment tuned for just the U.S. market.

U.S. delegation members said they don't expect any of these issues to be resolved until the last week of this month.

AT A GLANCE

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Up for Debate:

- Spectrum for next-generation mobile services.
- Standards for next-generation mobile services.
- Frequencies currently used by Sprint/MCI WorldCom in the U.S. for fixed wireless service.
- New frequencies for U.S.- and EU-backed satellite navigation systems.

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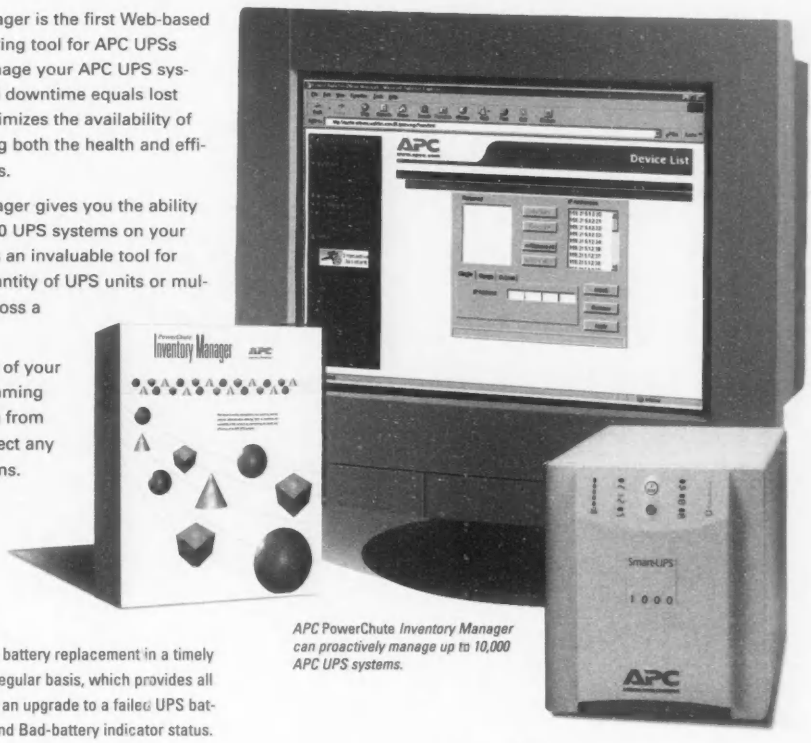

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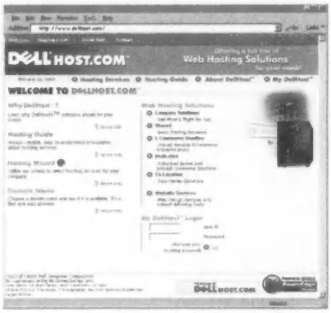

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Deadline Extended on Financial Data Privacy Law

Banking groups applaud longer transition period

BY LINDA ROSENCRANCE

FEDERAL REGULATORS have extended the deadline — from this November to July of next year — for financial institutions to comply with privacy rules outlined in a law passed by Congress last fall.

Industry groups such as the American Bankers Association (ABA) in Washington applauded the extension, though privacy experts said it was unwarranted.

"This is a transition period, not a delay," said Catherine Pulley, an ABA spokeswoman. "The law still goes into effect in November, but [companies] are not required to comply until 2001."

Under the Gramm-Leach-Bliley Act, also known as the Financial Services Modernization Act of 1999, regulators had until Friday to publish the final rules under which companies can give out consumers' financial information to unaffiliated third parties.

The act also mandates that companies let customers opt out of having their personal financial information shared with other firms.

The agencies involved in implementing the rules postponed the compliance deadline by eight months to give financial institutions time to gear up for the change, according to Cherie Umbel, a spokeswoman at one of those organizations, the National Credit Union Administration in Alexandria, Va.

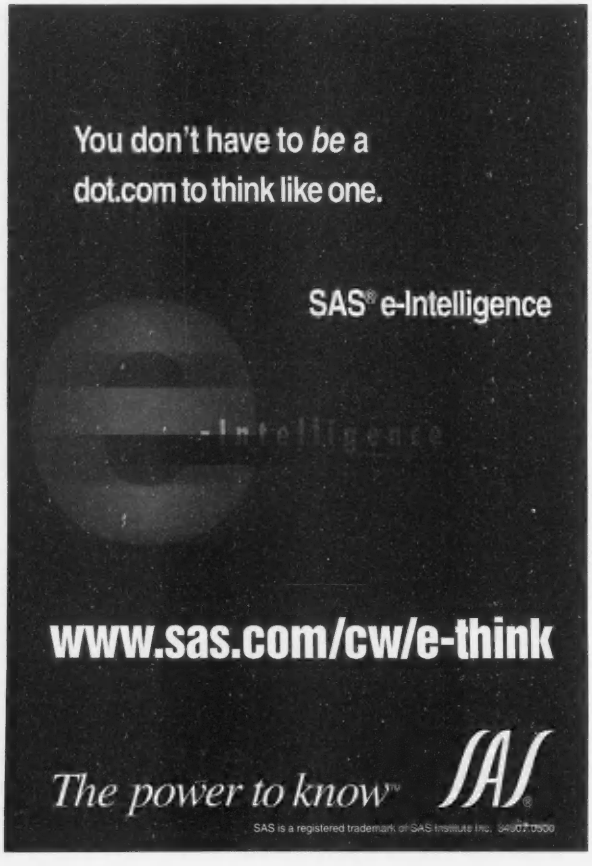
During a public comment period on the new rules, financial institutions asked for the compliance delay "as an operational issue," Pulley said. Most do end-of-year mailings to their customers and would have had difficulty complying with the law and sending out those mailings at the same time, she added.

But Mark Rotenberg, director of the Electronic Privacy Information Center in Washington, decried the move.

"We're very disappointed that the privacy law is not going forward [on its original schedule]," he said. "This is a modest proposal, and companies have had ample time to prepare. There is not justification for the delay. This just adds to the [contention] that further steps are necessary to protect privacy."

> This just adds to the [contention] that further steps are necessary to protect privacy.
>
> MARK ROTENBERG, DIRECTOR, ELECTRONIC PRIVACY INFORMATION CENTER

Anya Astafieva, an analyst at Meridien Research Inc. in Newton, Mass., said the extended deadline gives financial services firms more time to formulate their overall business and technology strategies for complying with the rules. It also gives firms an opportunity to observe how other companies are approaching the issue, she said.



Sun Dealt Third Defeat in Java Case

Judge rejects claim of copyright infringement

BY BRIAN SULLIVAN

Sun Microsystems Inc. last week was dealt another small blow in its legal battle with Microsoft Corp. over the Java programming language.

In a ruling, the judge overseeing a pair of lawsuits between the firms dismissed Sun's claim that Microsoft had infringed on Sun's Java-related copyrights.

U.S. District Court Judge Ronald Whyte also rejected Sun's motion for a summary judgment against Microsoft on the copyright issue.

The ruling follows two other preliminary defeats Whyte handed down against Sun from his bench in San Jose. It's part of a series of rulings on a total of 10 summary judgment requests that the two companies have filed in the 3-year-old case.

A Sun spokeswoman declined to comment further, pending Whyte's rulings on the remaining summary judgment motions. Microsoft officials did not return phone calls.

Sun filed suit against Microsoft three years ago, charging that the software vendor acted improperly by creating a nonstandard version of Java that was optimized for Windows-based systems. Microsoft denied the charges and filed a countersuit against Sun, alleging breach of contract, unfair competition and other charges.

A trial date has not been set.

Carnegie Mellon Starts Institute

BY JAIKUMAR VIJAYAN

Pittsburgh-based Carnegie Mellon University has launched an institute that will focus on developing new technologies and processes for dealing with Internet security threats.

An extension of the Computer Emergency Response Team Coordination Center (CERT/CC), the Carnegie Mellon Institute for Survivable Systems (CMISS) will work with firms on a range of security-related activities. Those include the research and development of new security products, education and training initiatives, trend analysis and forecasting, risk mitigation strategies and support for joint efforts between university departments and industry.

CMISS will seek strategic partnerships and deliver fee-based services to private- and public-sector companies. Unlike CERT/CC, whose funding is largely dependent on government agencies such as the U.S. Department of Defense and the FBI, CMISS will be able to receive money from and do research for any private or public institution.

CMISS's launch comes at a time when a spate of viral and denial-of-service attacks have heightened fears about computer security.

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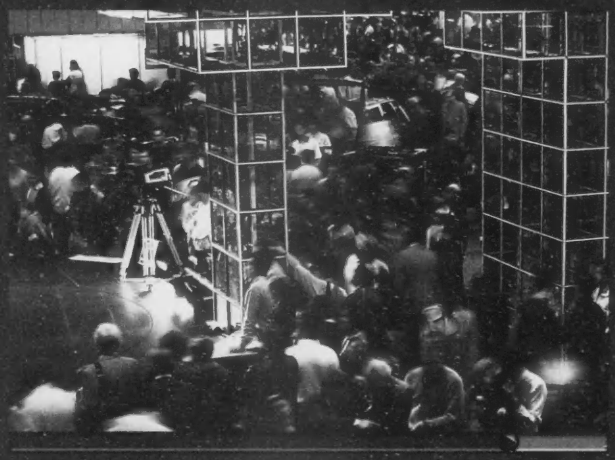
Us



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BRIEFS

NICC Has New Target

The start-up formed by Oracle Corp. CEO Larry Ellison to get $199 Internet-access devices into schools has a new target. Gina Smith, CEO of The New Internet Computer Co. (NICC) in San Francisco, last week said the company will "absolutely" target the corporate market. A corporate version of NICC's Linux-based device is expected before year's end, and it will be distinguished from the education and consumer versions by the software on the CD-ROM that accompanies it, Smith said.

Intel to Replace Faulty Motherboards

Intel Corp. last week said it will replace approximately 1 million PC motherboards designed around its 820 chip set because of a faulty component that could cause system failures and, under extreme conditions, data corruption. Motherboards shipped since November may have the defect. Systems shipped before then aren't affected, Intel said.

Lucent to Make Chips For Wireless Devices

Lucent Technologies Inc. last week announced a venture that will produce integrated semiconductor modules for use in next-generation wireless devices such as cellular phones and personal digital assistants. Lucent said it has developed a way to integrate memory, logic and other complex analog and digital circuits onto a single silicon chip. The first application planned by the Murray Hill, N.J., company will be in the radios that are at the heart of wireless devices.

Short Takes

HEWLETT-PACKARD CO. recently launched a line of entry-level Unix servers, part of the vendor's broader effort to earn a bigger slice of the estimated $10.8 billion worldwide market for such systems. . . . Japan's NTT COMMUNICATIONS announced an agreement to acquire Web-hosting and Internet services provider VERIO INC. for about $5.5 billion in cash.

Lotus Cedes Desktop To Microsoft Office

As back-end alternative, R5 update will support client application development

BY LEE COPELAND

LOTUS DEVELOPMENT Corp. is trying to more directly position its Domino server as a back-end messaging and collaboration alternative to Microsoft Corp.'s forthcoming Exchange 2000.

The strategy acknowledges the defeat of the Notes desktop client by the popular Microsoft Outlook client, yet allows Lotus to focus on back-end Domino 5.0 enhancements that better hook into Microsoft applications.

Officials at Lotus said the new set of features is aimed at eliminating integration pitfalls between Domino R5 and Microsoft technologies.

The set of enhancements, dubbed "Bluejay," includes support for Outlook mail and calendaring, replication of Internet Explorer and a new Domino Network File Store for accessing Windows applications from Domino databases. Bluejay also includes native connectivity to Microsoft SQL Server 7 and Access 2000 and seven new Component Object Model components for integrating with Microsoft applications. Bluejay is due this fall, around the time Exchange 2000 is expected to ship.

The Domino Effect

Tom Austin, vice president of research and strategic practices at Gartner Group Inc. in Stamford, Conn., said offering wide support for Microsoft technologies gives Lotus an advantage over Exchange 2000, which doesn't provide the same connections to competing systems, like Domino.

"[Lotus'] internal strategy is that Domino will do a better job of supporting Outlook users than Exchange does, so the question is [whether it can] really deliver on that implied promise," said Austin. "That constitutes an interesting alternative for people with both Exchange and Domino in their shop, because it will keep people on Outlook but move the back end to Domino. And Microsoft has no such strategy."

Enrique Crespo, manager of MIS at industrial machines maker Ingersoll-Rand Co. in Woodcliff Lake, N.J., said better integration with competing technologies like Microsoft's only improves the scope and appeal of Notes/Domino.

"Lotus wants to give users the quick-and-easy approach of Microsoft, so why reinvent the wheel and add in new stuff [to the Notes client]? Just give better access to Microsoft," said Crespo. "The things that they are coming out with now [to integrate with Microsoft technologies], we don't necessarily need, but if we were to make an acquisition it would be nice to have them in place."

Last May, Microsoft announced that Exchange 2000 would feature a digital dashboard, which is a desktop portal and Web-based file store; wider support for mobile and wireless devices; and tighter integration to SQL Server. Lotus has also announced its own desktop Portal Builder template for Notes R5. ◗

AT A GLANCE

Lotus' Flower

Lotus Development's "Bluejay" aims to ease integration with Microsoft's technology:

- Support for Microsoft Outlook mail and calendaring
- Replication of Internet Explorer
- Domino Network File Store for accessing Windows applications
- Native connectivity to Microsoft SQL Server 7 and Access 2000

Exabyte, StorageTek Hurting

Vendors post losses in growing industry

BY KATHLEEN OHLSON

The magnetic-tape storage market is expected to double in the next few years, according to one analyst firm, but tape vendors Storage Technology Corp. and Exabyte Corp. aren't reaping the financial rewards. In fact, both lost money in the recent quarter.

Both companies are sound and have good technology, analysts said, but they have missed the boat for different reasons. Both claim to have strategies in place to get back on board.

According to International Data Corp. in Framingham, Mass., the tape industry will grow from $2.1 billion in potential original equipment manufacturer sales last year to $4.6 billion by 2004.

That's due largely to storage needs fueled by e-commerce applications and data.

Tape is one medium that companies use to back up their data; disk is the other. EMC Corp. in Hopkinton, Mass., is the leader in the disk space.

The tape space is more fragmented, with pieces belonging to IBM and Hewlett-Packard Co., as well as StorageTek, Exabyte and other niche vendors.

Louisville, Colo.-based StorageTek has been troubled for a while. It announced layoffs of 1,300 employees after incurring higher losses than expected last year. Analysts said the financial problems stem from the company's lack of focus and the fact that it overextended itself, delving into the storage service business, for example.

"It's a disturbing trend for [StorageTek], in a storage market that's burgeoning," said John Webster, an analyst at Illuminata Inc. in Nashua, N.H. The most recent quarter, ended March 31, was no exception: Sales slipped 11.2% to $460 million from the same quarter last year. That resulted in a $39.5 million loss compared with a $5.8 million profit for the same period last year.

Boulder, Colo.-based Exabyte has also had financial woes: Last month, it reported $49.5 million in sales for the first quarter, or 26% less than the same quarter a year ago. It posted a $13.5 million loss; the year before, it had a $3.5 million loss for that period.

Analysts said Exabyte's woes can be attributed to a four-year product lag that put competitor Quantum Corp. in Milpitas, Calif., ahead. However, last December, Exabyte finally rolled out M2, its answer to Quantum's digital linear tape.

Both companies' executives concede that missteps occurred but said they're confident new products and refocused strategies will turn their financial fortunes around. StorageTek is banking on its open storage-area network (SAN) strategy with its line of StorageNet SAN components, while Exabyte now has M2.

One user said he is content to stay with StorageTek as long as the company continues to support its products. In any case, Rich Ward, systems manager at Keystone Mercy Health Plan in Philadelphia, said he'll stay with tape rather than go to disk. ◗

Tough Times

These tape storage vendors have suffered financial losses despite a growing industry:

STORAGE TECHNOLOGY CORP.	
Revenue:	
Q1 2000	$459.66M
Q1 1999	$517M
Profit or Loss:	
Q1 2000	$39.5M loss
Q1 1999	$5.8M profit
EXABYTE CORP.	
Revenue:	
Q1 2000	$49.57M
Q1 1999	$62.65M
Loss:	
Q1 2000	$13.5M
Q1 1999	$3.5M

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MARK HALL

Unrest in Linux Land

WE'RE IN THE MIDST of the first true test of the open-source movement. Linux, open source's poster child, is under fire. Here's just a sampling of Linux's current woes.

Last year, if you ran a Linux start-up, venture capitalists or Wall Street investors were throwing money at you as if you were a cast member in television's *Friends*. Now, it's as if they want to cancel your program.

MARK HALL is *Computerworld*'s West Coast bureau chief. You can contact him at **mark_hall@computerworld.com.**

Investors and paying customers are shunning Linux businesses like Nielsen viewers avoid PBS. Bellwether Linux stocks such as Red Hat and Caldera Systems are trading near their 52-week lows. International Data Corp. has estimated that despite Linux's strong 25% share of the server market, the operating system generates somewhere south of $35 million in revenue out of a market that tops $5.7 billion. The one bright spot in the Linux market went dim when, earlier this month, Linuxcare Inc. pulled its IPO and announced layoffs.

More turmoil bubbled to the surface last week, when the Linux Internationalization Initiative and the Linux Standard Base combined to form the Free Standards Group (FSG) in hopes of staving off increasing worries that the open-source operating system is becoming too fragmented. But in the face of criticism, the FSG pledged to be "sensitive to the idea that Linux development should not be stifled," suggesting that a single Linux release will remain as elusive as a unified Unix.

The bad news goes beyond money and politics. Linux devotees also learned this month that the 2.4 kernel would be pushed from summer to fall, evoking memories of endless Windows delays. This is especially troublesome, because the operating system isn't a prime-time competitor in areas such as clustering and SMP. And its user-interface shortcomings mean the desktop market for Linux is about as close to zero as counting allows.

But all this trouble in Linux Land hasn't put its IT supporters on edge. With the source code at their fingertips, IT managers know there is little at risk for them, and so they will continue to deploy the system. Their ongoing support for Linux is vital for the open-source movement to get through this market test, which, I think, it will pass with flying colors. ◗

ALAN PALLER

How information security officers can be successful

INFORMATION SECURITY officers (ISO) often struggle to be successful. Many find they can't improve security because they're unappreciated by their bosses, ignored by the business managers they're supposed to serve, adrift in technology they don't fully understand, ridiculed or ignored by auditors and systems administrators, or all of those things.

ALAN PALLER is director of research at the SANS Institute in Bethesda, Md. You can contact him at **paller@sans.org.**

But not all ISOs are grumbling and falling short. Ten out of the 120 with whom we recently spoke appeared to be respected and supported by their bosses, sought out for counsel by business managers and accepted and appreciated by the systems administrators. That combination allows them to make major advances in improving security.

Three habits seem to make those 10 ISOs different:

1. They made security part of the business process rather than a barrier to business growth. They did this by automating configuration management and security testing, establishing processes that ensure that security is designed into new systems early and working with business units to make new systems as safe as possible while still deploying those systems quickly enough to maintain competitive advantage.

2. They hired top-flight technical talent for their security teams to enable effective discussions with systems and network administrators as well as application developers. Says one, "Every organization I've worked for has [initially] had a technically weak and thus despised security function. Usually what we do is replace the technically hopeless with smart technical security people."

All 10 say security was more than a technology problem, but none takes pride in being "nontechnical." One highly successful ISO who didn't have a budget for a technical staff compensated by immersing himself in courses on advanced security technology, from interpreting IP headers to updating firewall rule sets to running hacker exploits. His answer on how he was able to master the technical material: "It's not rocket science."

Technical skills protect ISOs from the profession's most common error: writing policies and procedures that can't be implemented.

3. Six ISOs earned support from top management

by succeeding in other important corporate roles before becoming security officers. They negotiated their authority before accepting the ISO role. Because the quality of their judgment was already proven, they had confidence to act forcefully and forge partnerships that worked.

What if you find yourself in an ISO position without the respect and support of top management? You could whine, but that's a career-limiting move. Instead, partner with the technologists or take the opportunity to immerse yourself in technical training.

ISOs have a unique responsibility for ensuring security. When they fail, they put their organizations and others on the Internet at risk. But they don't have to fail if they follow the lead of these pioneers.

DAVID FOOTE

'Soft stuff' need not be so hard to give to IT workers

MY COMPANY interviews thousands of IT workers annually, collecting data about their salaries, bonuses and skills. But IT workers can be a talkative bunch. We can count on hearing a lot about what they like and dislike about their work, their employers and their peers. It's pretty straightforward, intriguing stuff.

DAVID FOOTE is managing partner and research director at Foote Partners LLC, an IT workforce research and advisory firm in New Canaan, Conn. Contact him at dfoote@footepartners.com.

After years as an observer and analyst, I'm constantly amazed at how oblivious employers are to what matters most to their employees and how resistant they can be to providing it. And with current labor-market conditions, they're putting themselves in grave danger by not paying closer attention to what really drives their workers' happiness.

For example, why don't employers treat their people more thoughtfully? Many companies have grown accustomed to acknowledging basic IT pay issues (that is, paying more), accommodating workstyle requirements (for example, offering flexible hours and workweeks) and providing lots of training. This may address some of what their employees need, but what employees *want* is too often ignored. Because we tend to work hardest for the latter, confusing the two can have dire consequences.

Employers should ask their workers what they want and get them more involved in how to deliver it, but many simply don't. Even if workers can't get a lot of what they want, they tell us that employers score points just by sincerely inquiring. In fact, the personal approach to management goes a long way toward pleasing IT workers, especially when handwritten notes arrive from the top executive thanking them for their efforts. This ranks among the most powerful of all rewards and motivators, as evidenced by the hundreds of workers who tell us they save these notes and dig them out periodically over the years for personal morale boosts.

Succeess with so-called "soft" incentives requires thoughtfulness and empathy. While these are things we learn more often from our parents, they may also be developed with the help of mentors and coaches and through continuous management development programs. But as a culture, we don't do nearly enough encouragement. Consequently, my company's research indicates that workers change employers most often because of poor relationships with their managers or superiors. Interestingly, more than three quarters of the workers we survey fail to mention this in their exit interviews, and fewer than one in five employers have coaching and mentoring programs or formal policies that — in actual practice — encourage internal job mobility. Our research continually reinforces the direct connection of soft factors to IT worker motivation and happiness and it reveals the unwillingness of many employers to provide them consistently.

In addition to recognition and appreciation, IT workers need to feel a sense of belonging, most often satisfied by psychological ownership of an objective, a job or a team pursuit. Having someone, or something, to believe in, or who believes in you, also provides this. We hear how important a safe, supportive work environment is to stimulating fun, creativity and superior work output, and also how money spent on beautifying workspaces provides an enormous psychological lift that is palpable even to visitors.

Pizza and bowling parties. Rock-climbing and golf outings. An all-expenses-paid night on the town. Lots of communication. These will put some spring in the steps of your IT workers.

This shouldn't be so hard to deliver. But employers will offer a litany of excuses and brag about their generous salaries, cash bonuses and stock options. They're missing the point, and soon they'll be missing their people.

READERS' LETTERS

Don't forget the bread

I WAS ASTOUNDED to read that we're going to be served up news and advertising at ATMs ["Wells Fargo Rolls Out Web-Enabled ATMs," *Computerworld* Online, May 2]. This whole Web-enabled-culture-to-be makes me wonder which consumers they speak with when they contemplate doing these things? Each other, I guess.

I'm waiting for my Web-enabled bread box to notify me next time I'm at the ATM that my Wonder Bread is getting moldy. (Uh-oh, maybe I've just given away a patent idea. I hope my ATM cc's my lawyer.)

J. Getter
Atlanta

Microsoft's record is less than clear

I NOTICED THAT Mark Hall's "floopy" editorial "Go Soft on Bill" got many less-than-flattering responses from readers. Now he writes "More Than Money" ["News Opinion, April 24], wherein he describes the "calm clarity of one ruled from Redmond." If Hall calls Microsoft's track record of bug-ridden and too-frequent software releases, useless upgrades, vaporware, predatory business practices and other abuses cited in the 101 lawsuits in 19 states "clarity," then I hope the current upheaval continues. [Hall] obviously has never run a business for profit and seen the results the Microsoft chaos has on the bottom line.

Dale Chiusano
Bethesda, Md.
dalec@sprintmail.com

Take Microsoft off-line

I AGREE WITH Mark Hall that Microsoft shouldn't be broken up ["Go Soft on Bill," News Opinion, April 10]. The punishment should fit the crime.

A fitting punishment would be that Microsoft must eliminate its involvement in the Internet area. No Internet Explorer, no Internet Information Server, no FrontPage, no FrontPage extensions, no HTML filters/conversion in Microsoft Office, no development products, no ActiveX, no Internet research for future products, no holdings in any company that is involved in Internet products.

Since Microsoft tries to eliminate or control standards that provide platform interoperability that benefits the end user, the company should be walled into the desktop and the LAN and kept from monopolizing another platform as it monopolized the desktop and almost monopolized the LAN.

Chris Cunningham
Lexington, Ky.

Hooray for Hands On

RUSSELL KAY'S Technology Hands On subjects are a crisp overview and introduction to products that are near the cutting edge and noteworthy. It gives me just enough of a taste to let me know whether I should pursue more information.

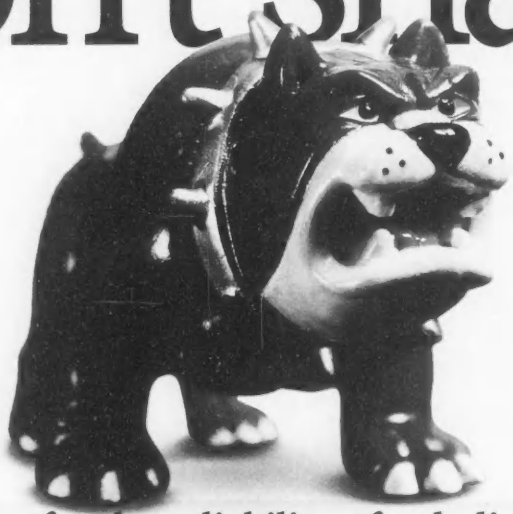
Perhaps Hands On might be added to the search engine or columns list on your Web site. We are a Microsoft Office shop, and I wanted to send the articles about MapPoint and Excel Extra to my boss, but it was a little difficult to find the articles via search.

Gary Schultz
Wisconsin Department of Workforce Development
Madison, Wis.
schulg@dwd.state.wi.us

Editor's note: *We are in the midst of a substantive site redesign at the moment. When the new site launches within the next several weeks, our readers will enjoy improved search capabilities, easier navigation and many new features.*

COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

Big dogs don't share.



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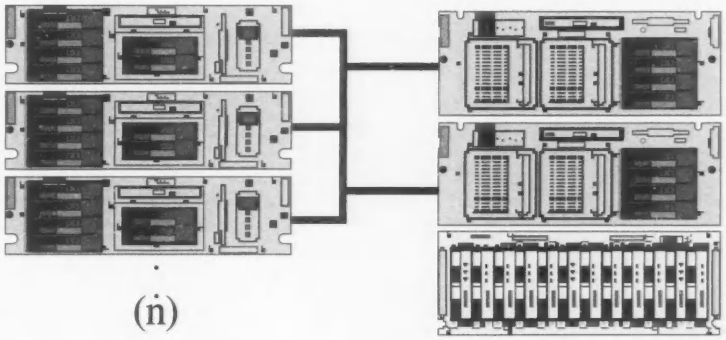

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BARBARA ANTHONY AND THOMAS COHN

Putting parents back in charge of kids' privacy

PRIOR TO THE INTERNET, it would have been unthinkable for businesses to collect detailed, personal information from young children without the consent of their parents. Confronted with evidence of the increasing use of the Internet to do just that, Congress quickly passed the Children's Online Privacy Protection Act (COPPA) in 1998. COPPA directed the Federal Trade Commission (FTC) to issue a rule governing the online collection and use of personally identifiable information from children under age 13.

The FTC's rule, which took effect April 21, requires Web site operators to provide notice and obtain "verifiable parental consent" before collecting or disclosing information from children. The rule and other relevant information is available at *www.ftc.gov/kidzprivacy*.

The statute and rule apply to commercial Web sites and online services that are directed to or that knowingly collect information from children under 13. The sites and services will be required to notify parents online about their policies concerning the collection, use and disclosure of children's personal information. With certain exceptions, sites will also have to obtain verifiable parental consent before collecting, using or disclosing personal information from children.

BARBARA ANTHONY is director of the Federal Trade Commission's Northeast Region, in New York.

The rule allows for the establishment of self-regulatory "safe harbor" programs. To set up a safe harbor, businesses and trade groups submit guidelines to the FTC for approval. If their guidelines pass muster with the FTC, they will be considered "safe" and in compliance with the rule. Web site operators can then use these guidelines as models for their own operations. Applications for safe-harbor status and public comments on these applications are posted on the FTC Web site (*www.ftc.gov*). The FTC's decisions on the applications will be announced in the *Federal Register* and on the Web site within 180 days after an application is submitted. Parents and others may contact the approved safe-harbor programs to see which Web sites are complying with their guidelines.

The FTC's next steps will focus on enforcement and education about the rule through various outreach initiatives. For example, we're launching a Kidz Privacy public education campaign and building partnerships with industry and consumer groups to raise awareness about online privacy issues. We're working with such groups as the national PTA to distribute educational materials to parents, kids and schools. We're also sponsoring training programs on the rule for consumer and business groups, as well as for state attorneys general, who have the authority to enforce it.

THOMAS COHN is a senior attorney at the Federal Trade Commission's Northeast Region office in New York.

COPPA and the FTC's rule provide important new protections for kids who surf the Net and for their parents. It puts parents back in charge of their children's personal information online. It gives them the tools to control who collects such information from their kids, how that information is used and whether it's shared with third parties. The rule implements one of the FTC's top goals: protecting children's privacy online. ▸

JOHN GANTZ

Big iron dilemma: We still need more

THOSE OF YOU WHO READ my column regularly know that I believe in a resurgence of the need for big iron, or servers of mainframes and storage systems that fill rooms. The growth of mission-critical Internet applications — which must scale to support thousands of users a day or even your smallest customers and must check every order in the supply chain — almost assures this. And the emergence of the application service provider (ASP) market is further proof.

We already see this trend at work in the network switch business. Terabit routers are among the hottest-selling products, and more network equipment is now being sold to telecommunications companies and Internet service providers than to large corporations.

So accept my premise for a moment that we'll need more big iron, then contemplate trends in the server market.

At IDC's annual conference in March on IT market trends, my colleague Deb Goldfarb presented a 10-year server market forecast that sees a market overrun by entry-level systems and dominated by vendors that serve the consumer market and are trying to make a buck as prices keep falling. It's actually a very vibrant picture, one with new distribution channels emerging, new computer architectures and players, and 10 times more systems out there, albeit smaller systems.

But the picture isn't very friendly to big iron. In the scenario most favorable to big iron, the designing and selling of big iron computers becomes a niche market plied by specialty vendors. Sort of like today's supercomputer market.

The underlying trends behind this picture include the following:

- Revenue from IA-64 processor-based systems passes that of RISC systems in 2004 (CISC is already pretty far out of the picture); a follow-on architecture emerges early in the decade.
- A shift in the skill base and generational turnover mitigate "legacy" system inertia and drive the success of outsourcing.
- The customer base for servers shrinks as buying points consolidate, partly due to the influence of ISPs and ASPs.
- Revenue from server shipments peaks at just under $100 billion in mid-decade before falling.

CIOs and others who must develop information systems to support this decade's new business models face this question: Will the new prevailing architectures (IA-64 and the follow-ons such as open-source software) provide the scalability, reliability, security and performance the new systems will need?

I don't see how they can. The idea of running the planet on Windows NT, on Intel-based servers, is scary. I'd have a lot more faith in systems like the IBM 3090. But the trend is turning away from monolithic, vertically integrated systems designed from the ground up to handle big loads. That's the big iron dilemma. Just as we need more of it, it's going away.

This may be a long-term picture, but as you migrate to the Wintel architecture — and the numbers indicate most of you will — keep in mind the larger forces you're helping to unleash. The number of big iron vendors will diminish, as will the skill base and resources to design even bigger iron. In your own shops, the skills to install, maintain and program big iron will disappear. You'll have to rely on outsiders.

JOHN GANTZ is a senior vice president at International Data Corp. in Framingham, Mass. Contact him at **jgantz@idc.com.**

I suspect the easiest way to ensure system reliability and scalability will be creating redundant systems and designing to new peak-to-average-load ratios. That means you'll have to spend more money.

All this will happen over the next 10 years, right in the middle of many of your careers. While you focus on building those Internet-based applications and dealing with cataclysmic changes in the industry, keep a career-preserving eye on the big picture. Make sure you understand the long-term implications of this trend to swap out mainframes for farms of Wintel systems; make sure you understand how rapidly capacity demand can grow in an all-Internet world; and make sure you have Plan B in place for handling unforeseen processing and storage requirements. ▸

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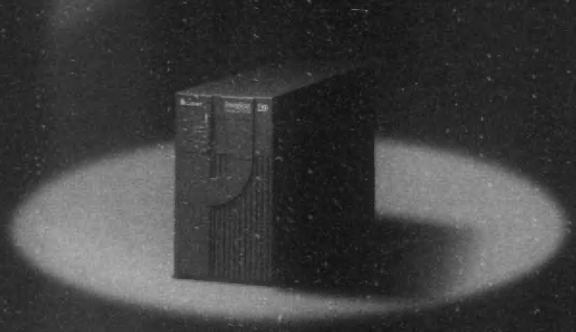

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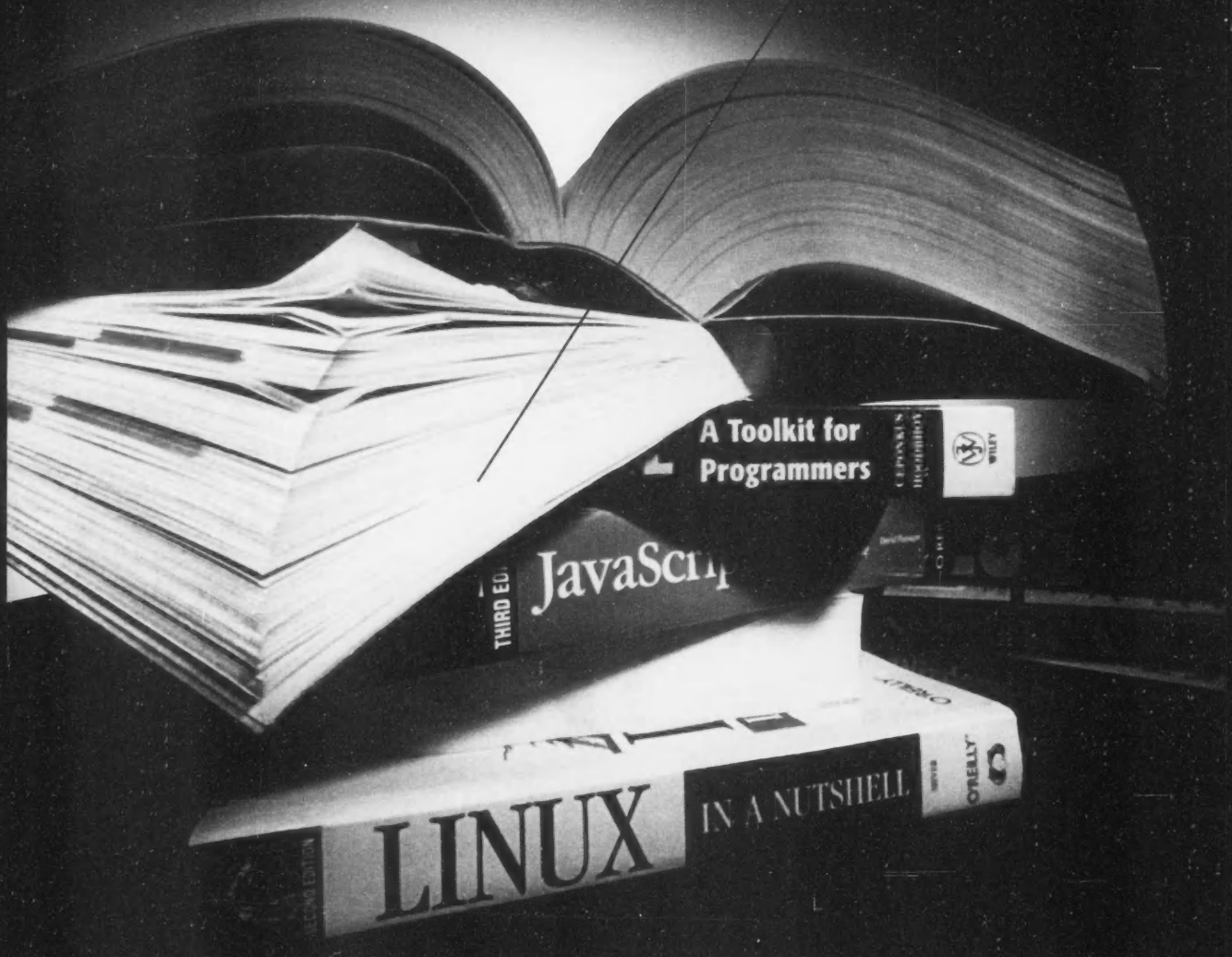

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BUSINESS

OVERSEAS BOOM

Global e-commerce will reach $6.9 trillion by 2004, according to a recent Forrester Research report. And companies such as Otis Elevator, GetThere.com and Ariba are scrambling to set up e-commerce networks abroad before the boom hits. ▸ 40

21ST CENTURY VIKINGS

The Vikings were powerful and used tools that left their mark. But they lacked the infrastructure to make Newfoundland a going concern. Kevin Fogarty writes that business-to-business startups have the same problem but could map the way for more traditional competitors. ▸ 40

CLIENT FOCUS

A year ago, Chicago-based Northern Trust launched a new customer relationship management project aimed at bringing together disparate data on its 800,000 clients. The goal was to give its sales force instant details about current and potential customers. But the bank is finding that the new system provides more benefits than it ever imagined. ▸ 42

TELECOMMUTING WITH A TWIST

Sailing the high seas, lounging on the beach, relaxing with friends — for Web development contractor Nancy Andersen, there's a very fine line between work and play. With her laptop in tow, she's managed to secure gigs that have allowed her to travel throughout Cambodia, Singapore, Thailand and Indonesia. ▸ 42

GREETINGS!

Ever wonder what it's like to work at Blue Mountain Art, the online greeting-card retailer recently bought by At Home Corp.? How long are the workdays? Get the inside scoop on the hours and more from the company's director of engineering and operations. ▸ 46

OPENING DOORS

Development projects are too often mysterious processes, leaving customers with little perspective on how things are actually progressing, writes Ed Yourdon. Giving users easy "views" of how an IT project is proceeding can help keep them in the loop and avoid problems in the long run. ▸ 46

AFTER Y2K

What happened to former managers of year 2000 projects? Many moved into more challenging roles. But for others, life after the date change hasn't been as rosy ▸ 56

MS. MIS

Kathleen Melymuka says women who led Y2k projects are poised to leverage their experience in other areas, but many haven't received their just rewards. ▸ 54

MORE

Advice 60
Careers 52

MICHELLE GOODRICH, an IT specialist in Sacramento, Calif., says poor communication has led to "total chaos" on a Web/database project she's working on

SETH AFFOUMADO

WHY IS YOUR STAFF LEAVING?

THINK YOUR STAFF IS LOYAL? Well, only 5% of the respondents to a recent *Computerworld* survey said they are definitely staying put. And 40% said they plan to stay at their current jobs no more than a year. Why? More money, better training opportunities and greater challenges are the top reasons, but the list goes on. Find out what's happening to job loyalty.

52

Foreign Markets Draw B-to-B Firms Overseas

U.S. exchanges go international

BY MICHAEL MEEHAN

From elevator companies looking to sell lifts in Paris to maintenance suppliers that want to move lighting fixtures in Mexico City, U.S. companies are building international e-commerce networks in anticipation of a windfall.

Last week, Ariba Inc. in Mountain View, Calif., opened its first business-to-business marketplace in Latin America, offering maintenance and farming products to Mexican businesses.

"It's early. It's very, very early," said John Schweig, vice president of business development and international operations at W. W. Grainger Inc., a $4.5 billion building maintenance and repair supplier based in Lake Forest, Ill. "The e-commerce market is still in its prenatal stages here, but the pickup rate should be nothing short of incredible, and we want to be one of the leaders in that."

Cambridge, Mass.-based Forrester Research Inc. agrees. It recently released a report estimating that global e-commerce will reach $6.9 trillion by 2004, up from a projected $655.8 billion this year.

More than 90% of that growth is expected to occur in the business-to-business sector. Forrester predicts that foreign markets, which now account for 25% of the global picture, will to grow to $3.7 billion, or 54% of the total market, by 2004.

Marketplaces on the Way Up

Otis Elevator Co. in Farmington, Conn., sells roughly 22% of the world's elevators, primarily in Europe, but none are sold online — yet.

Before it starts taking online orders at the end of this year, Otis intends to create a functional, multilingual Web site.

A version of the new site debuted in January, and the goal is to serve 49 countries in 29 languages by next month, said John Doucette, Otis' vice president for information systems.

Next week, Otis will unveil an online service through which French architects can lay out their building specifications and have Otis' engineers determine what types of elevators are needed.

"We have a complex product, and we need to teach people how to shop for it," Doucette said. Otis expects 25% to 30% of its overall growth during the next three years to come from business conducted via its Web site.

Ben Wright, Ariba's director of marketing for Europe, the Middle East and Africa, said he thinks companies awaiting a European boom will be rewarded next year. The growth of business-to-business marketplaces in Europe is progressing far faster than the rate he saw during the early stages of their development in the U.S.

"We're absolutely overwhelmed with people calling us, wanting to put together marketplaces," Wright said.

GetThere.com Inc. in Menlo Park, Calif., opened a London office last fall and is constructing a European marketplace for its business-to-business travel clients. Stateside, GetThere boasts a client list that includes Lucent Technologies Inc., The Boeing Co. and The Procter & Gamble Co.

"U.S. multinationals are driving us into the market," said GetThere Chief Operating Officer Ken Pelowski.

New markets mean adding new languages and performing transactions in different currencies, he said. Also, Europeans travel by ferry and train far more than Americans do, thus forcing GetThere to differentiate its product.

"You have to localize your offerings and customer support, or you won't make it over there," Pelowski cautioned.

Online and Overseas

The predicted boom in business-to-business e-commerce will affect much of the world within the next few years:

	2000	2002	2004
North America	$509.3	$1,495.2	$3,456.4
Asia-Pacific	$53.7	$286.6	$1,649.8
Western Europe	$87.4	$422.1	$1,533.2
Latin America	$3.6	$13.7	$81.8
Rest of world	$3.2	$13.5	$68.6
TOTAL (millions)	$657.2	$2,231.1	$6,789.8

SOURCE: FORRESTER RESEARCH INC., CAMBRIDGE, MASS.

KEVIN FOGARTY/BRICKS AND CLICKS

Dot-coms go a-Viking

APRIL 3 — THE DAY the Nasdaq dropped 350 points and shattered tech stocks' image of invincibility — is the same kind of milestone as the day the Vikings abandoned Newfoundland.

That's not as odd a comparison as it sounds. The Vikings developed a cool technology that let them maraud freely against the stones-and-mortar powers of the day. They sailed their seaworthy but shallow draft boats far up waterways to raid relatively undefended inland towns before land-based forces could react.

Sounds like the early days of e-commerce, doesn't it, when the CDnows and Amazon.coms and Monster.coms had traditional companies on the run?

Like the pure plays, though, the Vikings didn't find a raid-based economy sustainable.

So they built colonies in England, Ireland, Greenland, Iceland and, eventually, Newfoundland. But they didn't have the national unity or infrastructure to make those colonies dominant. Most were assimilated.

Others, like Newfoundland, were abandoned.

Within a few hundred years, though, other Europeans learned to build up a colonial infrastructure that could support technological superiority — to the point that their colonies outmatched and dominated American Indians, who had a more sophisticated political and cultural infrastructure on the continent and could put an army in the field without having to send it across an ocean first.

Technology plus infrastructure beats technology — or infrastructure — alone.

It's just as true in the B-to-B market, where promising new companies will attract a lot of early attention and then wither before they can build their businesses enough to sustain themselves.

On the other hand, companies that can webify their existing business infrastructures can leave the pure-play exchanges sucking wind.

Often, making that happen will depend on cooperative efforts such as that of the Big Three automakers, which are building a common marketplace where buyers and suppliers can cut the cost of buying supplies or find additional business.

KEVIN FOGARTY is *Computerworld*'s business editor. Contact him at kevin_fogarty@computerworld.com.

It doesn't take the sexiest new technology to make this work, either. A front-page *Computerworld* story last week pointed out that EDI — the kludgy, pre-Internet data exchange protocol that should have died a dinosaur's death a long time ago — is growing 15% per year.

That's happening because firms are finding that they can build new B-to-B connections without developing whole new XML lexicons. And they can do it while automating transactions, not just printing out orders and passing them on.

In contrast, fewer than 15% of online exchanges can add value to a transaction or even handle a transaction from end to end, according to a study conducted by consultancy A. T. Kearney Inc. They have great ideas — but not the infrastructures to execute them.

Those firms, for the most part, rely on infusions of cash from Wall Street to sustain them. When the Nasdaq tanks, can the farewell to Newfoundland be far behind?

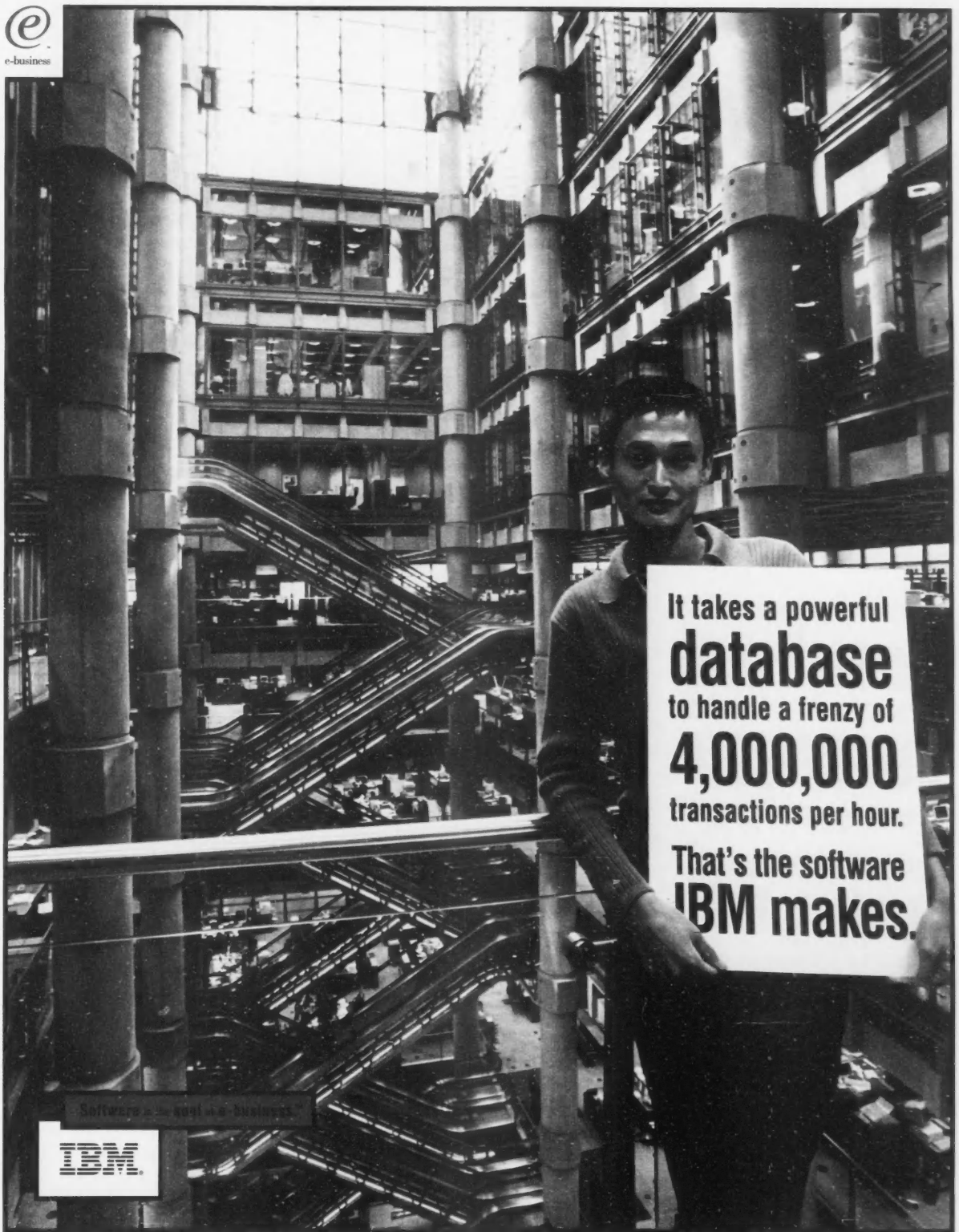
That will create openings through which even the most lagging traditional companies can leap to take advantage of territory the dot-coms have mapped out — if they can adapt. And there's a historical analogy to that, too.

When Commodore Matthew Perry sailed into Tokyo Bay in 1853 with a string of high-tech steam frigates, Japan had one of the most insular, defensive cultures on earth. But someone onshore saw in that fleet the might that an industrialized nation could extend around the world and apparently thought, "Great idea!"

Seventy years later, Japan was Westernized, industrialized and the dominant force in its region.

Technology. Infrastructure. Adaptability. Those are the factors that determine who succeeds and who fades away — in politics, business and e-commerce.

I wonder if Jeff Bezos is of Scandinavian descent?



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Instant Customer Data Gives Bank Sales Force an Edge

CRM system lets Northern Trust craft quick, personalized sales pitches

BY MATT HAMBLEN

NORTHERN Trust Corp. is one year into a complex customer relationship management (CRM) project that gives its workers around the world vital data on 800,000 clients.

The project is worth its $2 million cost, said Steve Locke, vice president of CRM at the Chicago-based company.

About 200 of Northern Trust's salespeople now have access to the tools in the JSales product from Youcentric Inc. (formerly Sales Vision) in Charlotte, N.C. By September, that number should swell to 2,000 users worldwide, Locke said. In a year or two, he added, 5,000 sales and relationship staff and back-office workers will have access.

Northern announced the project early last year. It went live about four months ago.

"It has taken so long because of the complexity of the data," Locke said. "Imagine combining data sources from 15 areas going back dozens of years. ... This is a many-years' journey."

But the benefits are already apparent to salespeople, who used to spend hours or days searching for information in those 15 areas, which include personal banking and trusts. They can now gather the same data in just 30 seconds, Northern Trust officials said.

JSales also lets sales managers generate reports on all the calls and sales opportunities available. And salespeople can quickly create reports for managers on their workloads.

For customers, JSales will provide more flexible banking services, said Locke. For instance, a customer can travel from Chicago to a winter home in Florida, where bank staff could quickly check his account and get authorization to cash a $15,000 check.

Salespeople can also trace high-end clients to familiarize themselves with them before meetings, said Pete Ruegsegger, director of e-commerce at Northern Trust's personal financial group.

"There is now the ability to track demographic data on customers across the system and even post red flags like, 'This is Patricia; don't ever call her Pat,' " Ruegsegger said.

STEVE LOCKE: "This is a many-years' journey"

Analysts say Youcentric is a small player in the CRM market, which is dominated by Santa Clara, Calif.-based Siebel Systems Inc.

The Yankee Group in Boston puts the worldwide CRM market at $2.5 billion. It projects the market will grow 40% per year for the next several years.

Locke said that while Youcentric is a smaller CRM vendor, it has been willing to spend time on implementation at no extra cost. Other well-known vendors might not have done so, he said.

Chris Selland, an analyst at The Yankee Group, said Youcentric is innovative. But he agreed that the biggest benefit is the company's willingness to do the extra work for free.

"There's great complexity in these packages," Selland said.

'Have Laptop, Will Travel'

The travel bug has undoubtedly bitten a few information technology contract workers, who often find themselves with a month or more to spare between projects. But Web developer **Nancy Andersen**, *a member of Contractor's Resources Inc. in Iselin, N.J., has spent a good part of the past two years combining work with globe-trotting.*

Andersen's wanderlust has taken her through Cambodia, Singapore, Thailand and Indonesia, where she now lives. She is developing a Web site for the Bali International Marina and is a regular graphic-design freelancer at New York-based Merrill Lynch & Co.

But this IT nomad will leave her tropical paradise at the end of this month to return to the U.S. In the meantime, she shared her experiences with Computerworld's *Julekha Dash.*

NANCY ANDERSEN

NANCY ANDERSEN finds a quiet space to work while sailing from Australia to Indonesia in November

Q: How and when did you get bit by the travel bug?

A: I started out in desktop publishing, and it's a job you can only have on-site. As I started moving into Web site work, I realized they don't really care where you are as long as you can produce the work and have a phone line to deliver. ... I was contacted by Merrill by e-mail, and they had no idea whether I was in New York or Bali, and they really didn't care. That was my dream come true.

Q: How do you get the technology to work?

A: I do often fall behind the latest techniques when I am offline for several months. ... However, Singapore is a technological mecca of sorts, so I pick up all the latest versions of my applications when I pass through.

Q: What equipment do you have?

A: The power source for my laptop and digital cameras are all 110 to 240 volts, so I just carry the necessary adapter plugs. And I travel with my Zip drive, with all my backups, for the inevitable crash.

Q: How do you keep your equipment safe?

A: The worst thing [I] have to deal with when traveling in the tropics is making sure [my computer] doesn't overheat. [I] need a dry box; it's what photographers use. I purchased the laptop I am currently using just before leaving the States, with a "global warranty" so I wouldn't be dead in the water in Asia.

Q: What's it like without an office?

A: Basically, it comes down to "have laptop, will travel." I can work anywhere, from the wheelhouse of a yacht to the balcony of an Indonesian guest house. I usually copy the files to diskettes and find an Internet café to FTP the work. Even in the tiniest, remotest places in the Third World, there's an Internet café. However, online access in Southeast Asia is nowhere near what we are used to in the States.

Here's an interesting new take on the term *computer bugs*. When [I work] at night, the laptop screen draws mosquitoes, gnats and God knows what else, like moths to a lightbulb. Keeping the critters from crawling into the keyboard or under the rim of the LCD panel is a full-time concern.

Manufacturers Struggle to Keep Pace With Microsoft

BY MATT HAMBLEN

The year-old Microsoft Manufacturing User Group (MSMUG) has urged the software giant to slow down the introduction of new operating system releases so its members can keep pace with upgrades.

Product turnover, or churn, is a major problem because manufacturers can't afford to implement new operating systems or service packs every time Microsoft Corp. releases an upgrade, the 50-member MSMUG said in its first report.

"If you are a large, multinational manufacturing company and [have] 700 facilities each with 30 to 40 software licenses running machines, it's not like you can shut down operations every three months to do updates," said group spokesman Dennis Daniels, director of business at ARC Advisory Group Inc. in Dedham, Mass.

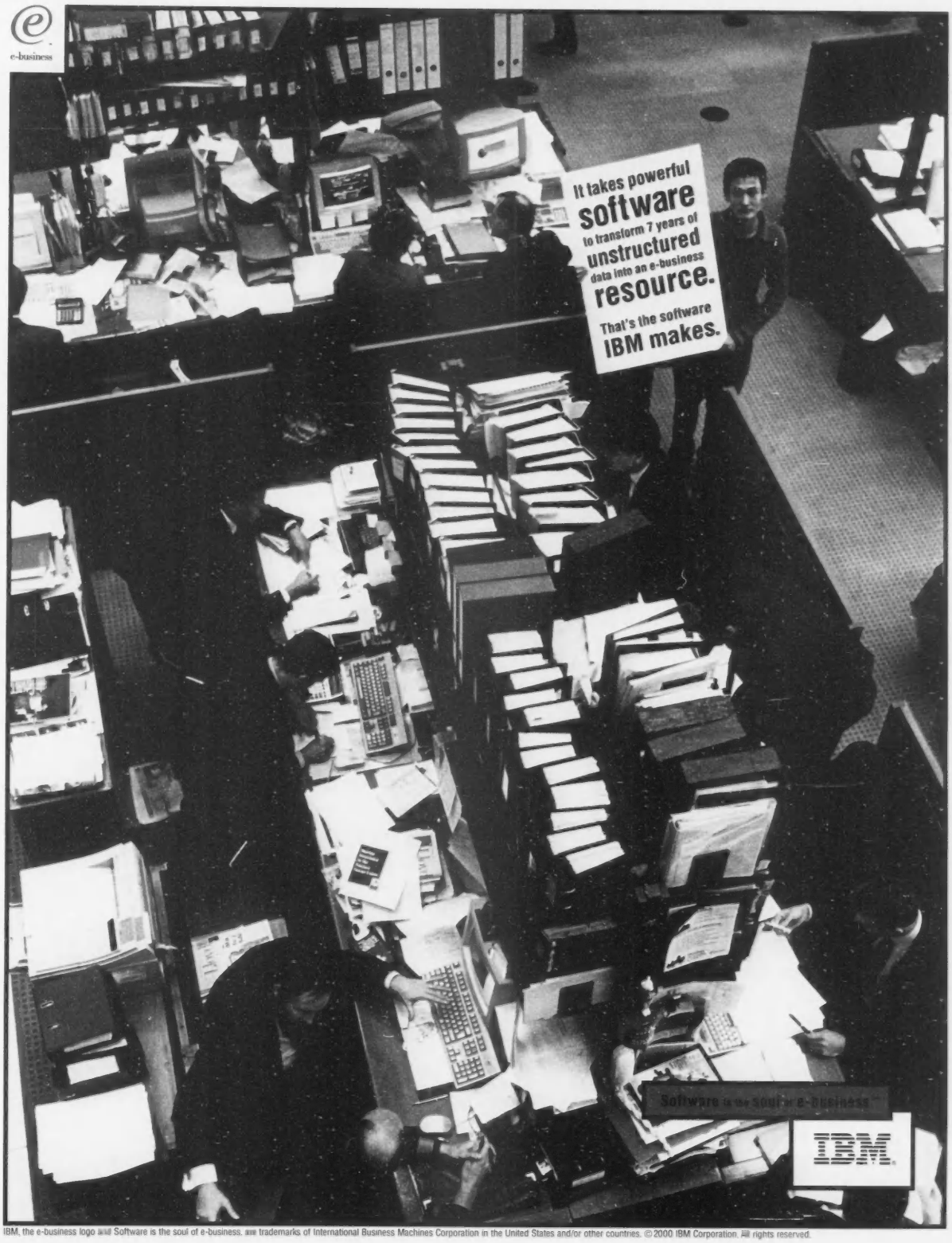
MS-MUG was created at Microsoft's behest after manufacturing users started buying Windows NT.

Procter & Gamble Co. has been using Microsoft software in its plants for a year and has needed more personnel to handle support and upgrades, said Dave Bauman, technology leader for corporate engineering at the Cincinnati-based company and chairman of MSMUG.

Ron Sielinski, technology evangelist at Microsoft, said through a spokeswoman that he has received the MS-MUG report and will respond to the members late this month or early next month. He declined to comment further.

Pat Kennedy, president of OSI Software Inc., a Microsoft reseller in San Leandro, Calif., disagreed that all manufacturing end users are unhappy. Kennedy said he loves the enhancements Microsoft is making, especially with Windows 2000 and Windows CE 3.0.

"[They're] the best thing to happen to the process industry in years," he said.



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WORKSTYLES

What It's Like to Work at . . . Blue Mountain Art

Interviewee: Michael Shindle, director of engineering and operations
Company: Blue Mountain Art, an electronic-greeting card Web site recently acquired by Redwood City, Calif.-based At Home Corp., owner of Excite@home.com.
Main locations: The IT staff is in San Diego.
Number of IT employees: 13
Number of employees (end users): More than 80
Dress code: "If you're not meeting with anyone, and no one is coming into the office that day, it's basically 'No shirt, no shoes, no service.' If we're meeting with people, the code moves up a notch to California Casual."
Workday: "People get into their own rhythm. Some work 8 a.m. to 4 p.m., and some work 12 to 10 p.m."
Must people carry beepers? Cell phones? "We all have them, and if something goes wrong, you're expected to respond. This is not so much a job as a new lifestyle you take on, in which what you do ebbs and flows with the site. If the site is suffering stress, you suffer stress. If it's stable, you're free to have a life."
Does the company provide connections from home? Yes, via cable modem.
How hectic are things around Mother's Day? "We'll send out over 6 million cards. . . . That's a definite peak – we'll notice it. But we sent out over 16 million cards for Valentine's Day; 40 million for the whole month of February. We were here for 36 hours straight.

Mother's Day won't be like that. We'll be alert and ready, and we'll check the site more often than we would during a normal weekend. But we're scaled to handle bigger peaks."
Number of cards sent on an average off-peak day: 1 million
What does scaling up entail? "Our current architecture is a very good design, but we didn't grow it enough last year to handle the load, so we want to make it more efficient."
Any applications in development? "Applications are fairly stable right now. We don't want to modify the user interface, because that has worked for us. But some applications will be revised and updated. We want to add to our international features; we want to add functionality, like a one-click, multiple-send feature and voice attachments to cards. And eventually, we'd like to do something with video attachments."
Training: "Training is self-directed. [The company will] send you where you want to go and help you become what you want to become."
Does being part of a larger company create new career paths? "Yes and no. Yes, you can create them, but not unless you want to change your life. For example, my developers are senior enough that they could manage other developers. But they would have to move to Redwood City [in Silicon Valley]. So the paths are there, but the cost may be higher than anyone is willing to pay."
Are compensation or bonuses different now that you're part of Excite? "One difference is that Blue Mountain was a private company before. So now we have stock options that are actually traded on the open market."
In what other ways has the company changed since being acquired? "It's still too early to tell, but I think it brings more corporate culture. Like before, maybe we'd all take the day off and go to the beach. . . . Excite is not as corporate as, say, the IBM blue-uniform mode, but we are even less corporate than they are."
Office mascot: "Nikita, one of our employees' dogs. People can bring their dogs here, but they have to be cute."
On-site amenities: "Our proximity to the ocean."
Number of employees who telecommute: Three
Last companywide or department perk: Comp time following the Valentine's Day peak. "I'd like to take everyone to Vegas. I'm always threatening to do that."
Quote: "We're small, we're nimble and we can make things happen." – *Leslie Goff*

ED YOURDON

'Viewing' the project

IT'S AN OLD JOKE that IT development projects are on track until a week before the deadline, at which point the customer discovers that the project is really six months behind schedule. The developers may have worked long hours, but it often turns out that nobody fully understands the status of their project deliverables.

One reason the status and deliverables are unknown is that the developers' *processes* are "hidden" from the project manager and end users; it's almost as if the developers were coding in the dark.

I learned the significance of this on a recent trip to India, which is rapidly becoming recognized as the center of software development excellence. Of the 10 software organizations in the world that had achieved a Level 5 rating on the Software Engineering Institute's (SEI) Capability Maturity Model scale last September, five were Indian. And an amazing 40% of the world's 59 high-maturity organizations (those at Level 4 or 5) are in India.

The scale provides the basic explanation of the "hidden process" dilemma. An organization at Level 1 has no defined process; hence, neither the developers nor the manager nor the customer knows what processes are being performed. In contrast, an organization at Level 3 or higher *does* have a defined process, and if anyone wants to see it, there's a document that describes it in detail. Good project management goes hand in hand with formal, disciplined processes that are carried out consistently; everyone knows what deliverables are associated with each activity and there should be very few surprises along the way.

Good project management goes hand in hand with formal, disciplined processes.

But what about end users who have been burned on previous projects and who aren't passionate believers in SEI? They might ask, "How do I *know* that your developers are following a formal process?" If the project manager says, "Here's a description of the process, and it's the same one we followed on our last 10 projects," the cynical user might still say, "We don't care about your last 10 projects! How do we know you're following it *this* time?"

There are two familiar ways to answer this question: produce frequent prototypes throughout the project, and produce voluminous progress reports, updated weekly. But in today's "Internet time" environment, that may not be enough. A mission-critical e-business project may last only four weeks. If it takes a full week to find out that you're building the wrong system, you've already lost 25% of your time.

An alternative, as some of the best Indian software companies are demonstrating, is to make the software process *completely visible* so that the customer doesn't have to wait passively for a week before the project team delivers a status report. If the team is using a formal process that's implemented in a Web-enabled workflow-automation mechanism, if the team performs *all* its work within that environment, and if the automated process is "instrumented" with appropriate metrics, then end users can literally watch the process in motion, in real time, through their own Web browsers. They can observe requirements being created, modified and approved; they can observe design reviews, with metrics about the number of defects that were identified; and they can track defects to see whether any festering problems threaten the project's success.

Why is such an approach coming from India? Simple: Most of the large Indian software organizations are doing outsourcing projects for European and American clients. But even with their impressive SEI certifications, Indian firms face a credibility problem: Their clients just aren't sure if they can trust a project team that's located 10,000 miles away. The Web-enabled "visible process" approach goes a long way toward eliminating this problem and also provides a vast improvement in the project's manageability.

If IT organizations in the rest of the world don't start adopting some of these advanced methods and processes, they may find themselves at a severe competitive disadvantage.

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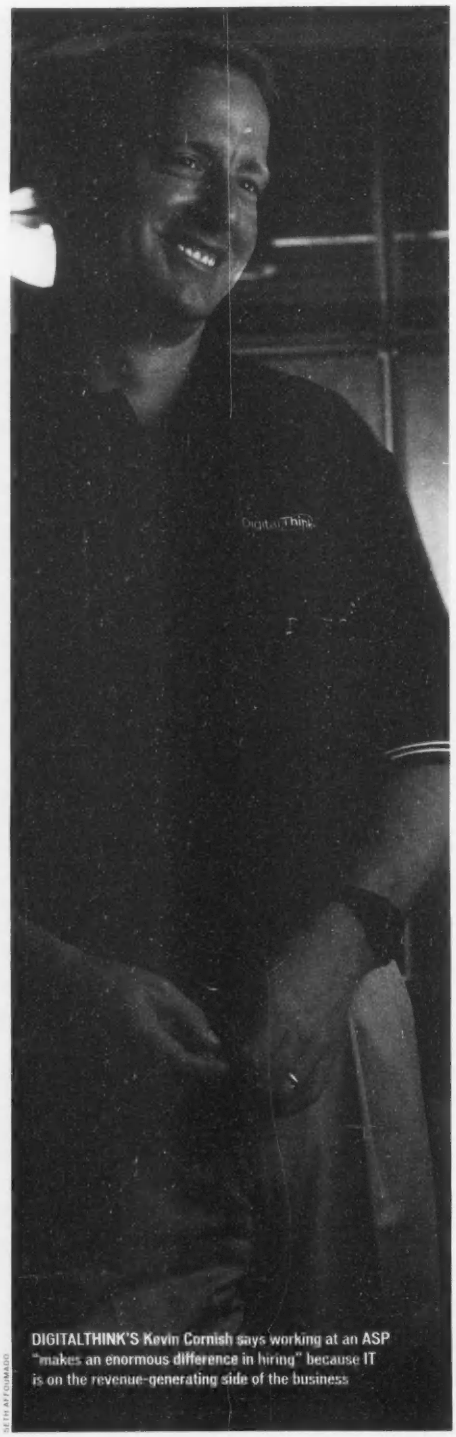

DIGITALTHINK'S Kevin Cornish says working at an ASP "makes an enormous difference in hiring" because IT is on the revenue-generating side of the business

SETH AFFOUMADO

These CIOs Really Mean Busin

IT managers at ASPs have a direct effect on the bottom line and direct contact with customers. By Mark Hall

Kevin Cornish, information technology director at DigitalThink Inc., was nervous. His Web-based training company in San Francisco — essentially an application service provider (ASP) — had won the contract to develop and manage Charles Schwab & Co.'s Getting Started Web site, which offers free courses for newbie investors.

The risks for the ASP were huge. Schwab's Web site was averaging 16 million page hits per day, and the San Francisco-based investment company was in the midst of a major expansion. Schwab was also trying to attract and educate new investors through major North American marketing programs that included prime-time advertising and direct-mail campaigns. No one knew how these promotional efforts would affect the new training site, which ran on DigitalThink servers connected to the main Schwab site.

"There was much fear and trepidation on our part because we did not know how many users would log on when we went live," Cornish recalls.

For Cornish and his colleagues, having a blue-chip client like Schwab is what they dream about — and what makes them lose sleep at night. Success would validate DigitalThink's training software, of course, but it would also prove to an important customer in a critical market that the nascent ASP business model works. Failure would mean more than disagreement over the usefulness of a product. It would cast doubt on the promise of ASP computing.

At ASPs, IT managers run the business itself. They aren't internal-looking executives overseeing corporate technology and operations. What they do is what customers see and use. They're the new breed of IT executives being honed in the rough-and-tumble, profit-and-loss world of the Internet.

Or as Rick Bernard says from his new 68,000-square-foot data center in Marlboro, Mass.: "IT needs to shift from thinking about technology to thinking about business partnerships and focusing with executive management on business initiatives."

The vice president for ASP operations at Hyannis, Mass.-based Infinium Software Inc., Bernard is helping turn his company from a mainstream vendor of AS/400 software into a service provider that rents software by the month to midsize businesses. The IT manager at an ASP needs to "focus on applications that exclusively generate revenue," Bernard says.

That means attending marketing and sales meetings. Roy Lowrance, CIO at Corio Inc., an ASP in Redwood City, Calif., gets involved in customer sales meetings even before a contract is signed. He says the ASP market is so new that traditional CIOs need assurances that a service provider can do the job.

"It's important for me to be involved in the politics of selling," he says, because, as an ASP, Corio handles strategic IT assets for companies. That means working with his sales organization and its customers to understand the benefits and limitations of the ASP infrastructure being sold, says Lowrance.

Before DigitalThink's Cornish launched Schwab's Getting Started site, he had to get involved early in his customer's marketing efforts, because they could directly affect system performance and the user experience. "We did not want to be surprised by a Super Bowl ad or something that could knock the site off the Net," he recalls.

Close Relationships Are Key

By working directly and regularly with Schwab's marketers, Cornish helped devise a slow, phased rollout of the site, which served to test the systems as well as the acceptance of the course work among online investors. The success at both ends has led to Schwab beefing up its promotion of the site and expanding the course load. But the crosstown partners continue to emphasize tight coordination between Schwab's marketing group and Cornish's team.

Linda Drumright, vice president of engineering at DigitalThink, says she enjoys an ASP's more intimate business relations with customers. "Selling ASP services to IT is not like shipping a CD with software that may or may not be used," she says. "Being this close to the customer is compelling."

As the vice president of systems engineering, Jim Cavalieri is the CIO at Salesforce.com Inc., another ASP in San Francisco. He generally schedules one sales meeting per day. Like Drumright, he says these encounters make his job far more rewarding.

But Cavalieri often finds himself reassuring IT managers who fret that their proprietary data in Salesforce.com's contact management application is on the same server as a competitors' information. Because ASP customers often share resources as they do at Salesforce.com's data center, the IT chiefs at ASPs are even more obsessive about security than most in-house IT managers.

Cavalieri says security must be designed into multiple levels — from guarding data from unauthorized employees to protecting it from competitors, who may share a server. Then there's the normal Internet riffraff. "The Internet," he likes to say, "has no walls." It's much more difficult to take existing client/server software and make it secure on the Web than to build in security from the ground up, Cavalieri says.

Because ASPs live and die by the shared data center, physical security is just as important. At Intira Corp. in Pleasanton, Calif., Chief Technology Officer John Steensen oversees a new data center that's protected with card-key and biometric access points, hidden doors and bulletproof glass. "We have to think beyond the 'hactivist' threat," he says.

Sharing, of course, is the underlying business model of all ASPs. By leveraging a data center and its software among multiple customers, an ASP can make money — or that's the theory. This business model leads to another distinctive characteristic of IT inside an ASP: There's no software customization. Traditional IT managers spend a lot of time designing, implementing and managing custom-tailored programs for their companies. In fact, that's often the IT department's main contribution to the business. Customization, on the other hand, is taboo for ASPs.

For example, Cavalieri's customers can't change Salesforce.com's software data model. The restriction is by design. If users were allowed to change things, ASPs would collapse under the weight of managing too many versions of a product.

David Goldchlag, chief technology officer at US-internetworking Inc., says he tries to avoid customization by creating "elaborate templates" for the applications that are hosted at the Annapolis, Md.-based ASP's data center. "It pays for us and the user to run applications in a general way," he says.

It pays for both sides, Goldchlag argues, because a critical value offered by ASPs is the ability to deploy software to users quickly. Consider the difference between using an ASP or a Big Five consultancy to deploy an enterprise resource planning (ERP) system. With a consultancy, you get every possible feature and function that its developers can put into a project. That's because consultants get paid through the development cycle, which can take up to 18 months.

"But [as an ASP] we don't get paid until the application is up and running," says Goldchlag, pointing out that an ERP project can be ready in as little as 60 days. "It may not have all the bells and whistles, but it will have most of them," he says.

Cutting Support Costs

Unlike other software suppliers, ASPs that own the code have the advantage of being able to upgrade all their customers at once — and as often as they like.

Salesforce.com, averages one major upgrade every four to five weeks, which a corporate IT manager or packaged software vendor would never attempt because it would alienate users. Even ASPs that resell packaged software can upgrade all of their customers at one time, cutting support costs dramatically.

Keeping support costs at a minimum is vital because the talent behind the support is so hard to hire, even with the advantages many ASPs offer. "Resources are tight across the board. The existing pool of talent can't staff the whole IT world," Goldchlag notes. "Our hiring has to be aggressive as well."

One lure ASPs can float before job candidates is a stock option package, which most IT managers can't compete with. "The potential that pre-initial public offering stock options represent is compelling and is not found in the traditional IT world," says Philip Carey, chief technology officer at Bluetrain.com Inc. a Walnut Creek, Calif.-based ASP offering groupware. The chance of hitting the initial-public-offering lottery tempts many IT professionals, but Carey says it's equally important that ASPs attract individuals "who want to make a big impact on the application," something not always possible in large IT shops with teams of developers and layers of operation staffs.

But for ASPs that have already gone public and can't appeal as strongly to greed, there remains another unique magnet for IT staff: the lure of actually being "the business" and working so closely with customers. At ASPs, the IT staff is not only at ground zero for technical advances, but it's also the source of the company's bottom line. This is a challenge few IT professionals have had in their careers, and it's something that appeals to many of them.

As DigitalThink's Cornish says, "It makes an enormous difference in hiring that we are on the revenue-generating side of the business."

Tellabs Shares Secrets For Scouting Students

Recent graduates and a manager at Tellabs Operations tell all about the company's successful internship program. By Julekha Dash

ANYONE WHO BELIEVES THAT twentysomethings have an inflated sense of entitlement may change his mind after chatting with Julie Cunningham, manager of global college relations at Tellabs Operations Inc. in Bolingbrook, Ill.

Cunningham says you don't have to make grandiose promises or give in to whimsical demands to bring tech-savvy recent college graduates on board. Rather, Cunningham — and recent graduates — say the key to luring students includes offering hands-on internships as well as providing opportunities for professional development, challenging work and a casual work environment.

Recruiting the Interns

The success of Tellabs' college recruiting program depends largely on the success of its internships: One-fifth of recent graduates hired by Tellabs were previously interns at the Lisle, Ill.-based company.

Cunningham revamped the internship program when she joined the firm five years ago. At that time, the program was a "little bit on the fluffy side," she says. By ensuring that managers viewed the program as an avenue for recruiting full-time employees, Cunningham changed its image.

"It's not a friends-and-family program," she tells managers.

Managers have to submit a request for an intern detailing the type of work that the student will perform. Cunningham makes sure that interns aren't assigned "grunt work."

If a manager's request "didn't look meaty," she would send the application back to be reworked, she says. And there's no room for students to slack off either: At the end of their internships, students must give a presentation on a project they completed.

Tellabs' internship program has left a lasting impression on some recent graduates.

Purvi Shah, a software developer, says she likes the fact that Tellabs assigns mentors to interns. Having a mentor meant that she "knew whom to go to and whom to ask, so I wasn't completely lost when I got here," she says. Having a support network is important for students who are hundreds of miles away from family and friends, says Shah, who attended Georgia Institute of Technology in Atlanta.

Recent graduate Anoop Mathew, a software developer, says he liked the career supervision he received during his internship. At Tellabs, interns are given "constant feedback about what you're doing," he says.

Former interns say Tellabs offered hands-on assignments. For Shah, this included writing a new graphical data-driven language and setting up configuration management tools. Mathew designed protection systems for telecommunications equipment. "I was impressed because it's a very complicated field, and I was actually thrown into that," he says. "I really liked that."

BLAIR JENSEN

JULIE CUNNINGHAM of Tellabs Operations has successfully revamped the company's internship program

Room for Growth

Recent graduates also cited Tellabs' opportunities for professional growth. Mathew chose Tellabs over Big Five consulting firms because he wanted to get a master's degree while working full time. He thought this pursuit would be easier at Tellabs — which is reimbursing his education — than at a consulting firm that would require constant travel.

Shah says she likes the fact that the company offers a diverse work experience. "If you get bored or tired, you can stay within Tellabs and move around," she says. Cunningham echoes this theme: Recent graduates develop expertise in a particular area, such as software development or hardware design, she says. They can then choose between two career paths — technical or managerial — but they can decide to switch gears later.

For many recent graduates, selecting a job boils down to the kind of work they will perform. Sarah Freda says writing Web programs that run telecommunications equipment holds a more promising future than the work she completed as an intern at a health care company.

"[The health care firm] had me program in a language I'd never heard of before," says Freda. "I thought, 'Where am I going to go with this program?' "

Most of these graduates say they chose Tellabs because of the security of working at an organization with an established reputation. "You hear about other companies with huge layoffs. Tellabs has never had that," says hardware developer Parmveer Singh.

But Tellabs "still has a small-company mentality," says Mathew. The company "allows you to think and come up with your own ideas. There's not a lot of paperwork. You decide what you want to do and do it," he says.

"[Tellabs] is laid back, yet work still gets done. Even managers sit in a cube, [and] they wear jeans," says Singh.

SNAPSHOT

TELLABS OPERATIONS INC.
Headquarters: Lisle, Ill.
Industry: Telecommunications
Number of employees: 7,700
Annual revenue: $2.3 billion

Tips for building a successful college recruiting program:
- Develop a good internship program (see chart below)
- Provide a casual work environment and open communications
- In addition to competitive salaries, consider offering stock options, signing bonuses or employee stock purchase plans
- Assign hands-on, challenging projects right away
- Provide opportunities for ongoing career development
- Provide a chance to work in different areas of the organization

How to get interns to stay full time:
- Provide support by assigning mentors
- Ensure managers provide challenging assignments – not grunt work
- Encourage interns to network with one another and with other employees
- If you want to make an offer, do so before the internship ends and keep the individual updated on the status of the job
- Deliver ongoing feedback on their performance

Which benefit do you desire most?
Responses from college students and recent college graduates:

Flexible hours	34%
Stock options	19%
More vacation time	13%
Ability to telecommute	13%
Better health plan	12%
Large signing bonus	9%

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End of Job Loyalty?

Only 5% of your IT staff is safe from recruiters; 40% plan to be with you no more than a year. We asked IT pros why they left their last jobs, where they plan to be next and what happens to job loyalty along the way. By Sharon Watson

TWO WEEKS after Damon Remy joined a hospitality company, his boss quit and almost all of the IT department was outsourced to a consulting firm.

"I was misled about the company and my role in it," Remy says. For example, though his title was director of information technology, Remy wasn't involved in making decisions about the firm's technological or strategic directions. "My boss had sent out a quarterly update memo listing 15 projects IT was involved in — and I only knew about three of them," he says.

But the straw that broke Remy's back was when he was ready to spend about $9,000 of his own money to get his Cisco and Microsoft network certifications — and the company wouldn't give him time off for the training.

Then he got a raise of just 3% after 18 months — even though his boss agreed that it wasn't commensurate with the value of Remy's performance.

"I felt like the abused stepchild," Remy says. He left in March to join a communications company where he hopes to work with the latest wireless data technology, be part of a team and see his impact on the bottom line. "I want to feel good about coming to work," he says.

Remy's got company. More than half the respondents to *Computerworld*'s recent Job Satisfaction Survey said their job satisfaction went down (again) in the past year. Almost 88% of the survey respondents said they are either actively looking to change jobs, thinking about looking or would take a new job if the opportunity presented itself.

More money ranked as the No. 1 reason for moving to a new position. Other considerations included more training opportunities, working with new technologies, more challenging assignments and a more interesting technical direction in a new employer's IT department.

Those are the matter-of-fact reasons behind a job hunt. Ask more than a dozen IT professionals why they actually left a company, though, and their answers are more complex. They involve relations with management, broken promises, lack of communication, internal politics and more.

Management is most often cited as the wellspring of dissatisfaction. Take the senior project manager at a multinational IT services firm managing the national network of a U.S. financial institution. Of the dozen people in his group, six are job hunting, and the rest are polishing their résumés, he says, even though the employer offers excellent training, bleeding-edge technology and fine benefits.

Are You, or Your Staff, Mirrored in These Complaints?

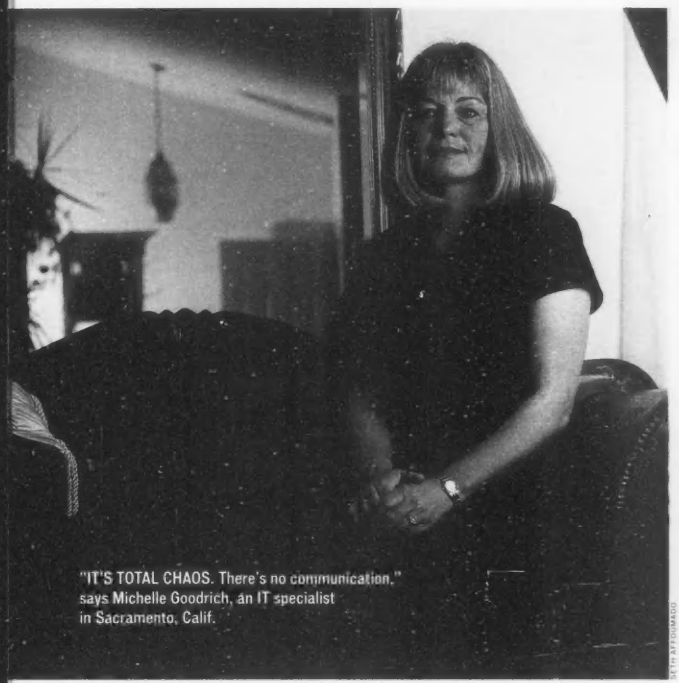
As part of Computerworld*'s recent Job Satisfaction Survey (see "It's the Opportunities, Stupid!" April 24), we asked IT managers and professionals why they left their last jobs, how happy they are at their present jobs and how long they plan to stay in their current positions. Many respondents shared thoughts similar to the following:*

■ SELLING OUR SOULS TO IT

Companies hire IT [employees] as salaried [professionals], thinking they can save money by having them work overtime and on weekends. No bonuses. No overtime pay. What's the incentive to be an employee? So-called intangible benefits. Might as well be an hourly contractor.

■ LITTLE PAY, LESS RESPECT

I'm unappreciated, underpaid, and my boss [the owner] is probably the only person his age whose ego is as big as his prostate. I'd get twice what I'm earning if I worked elsewhere. All of this combined keeps me from working at my full potential. If only half the people they hire here knew how to use a mouse, then perhaps I'd be able to work at full potential also. I'm seriously considering seeking new employment.



"IT'S TOTAL CHAOS. There's no communication," says Michelle Goodrich, an IT specialist in Sacramento, Calif.

SETH AFFOUMADO

WHY DID YOU LEAVE YOUR LAST JOB?	MEN	WOMEN
Higher salary	16%	12%
Greater opportunity for training and advancement of skills	14%	13%
Access to new and challenging technologies	12%	12%
Challenging assignments	10%	11%
Job security	8%	5%
Technology direction of IT department at new company	6%	6%
Greater control over work schedule, work hours	6%	9%
Relationship with current manager	5%	6%
Business direction of new company	5%	7%
Sign-on bonus	1%	1%
Other (not specified)	14%	17%
Not answered	2%	0%

HOW LONG HAVE YOU BEEN AT YOUR CURRENT JOB?	MEN	WOMEN
Less than six months	5%	8%
Six months to one year	12%	5%
One to two years	23%	22%
Two to three years	14%	15%
Three to four years	11%	8%
Four to five years	6%	5%
Five years or more	29%	38%
Not answered	1%	0%

HOW LONG DO YOU PLAN TO STAY AT YOUR CURRENT JOB?	MEN	WOMEN
Less than one year	28%	29%
One year	14%	13%
Two years	14%	11%
Three years	9%	13%
Four years	4%	3%
Five years	5%	6%
More than five years	24%	24%
Not answered	1%	0%

Methodology: Survey of 540 IT professionals, as part of Computerworld's Annual Job Satisfaction Survey

The problem? "I've been managed to death, and I don't see any leadership," says the project manager.

For example, he says his team's supervisors, who used to work for the team's client, are so uncomfortable working on the vendor side that they balk at enforcing contract provisions that require specific, detailed implementation plans. So the project manager's colleagues receive plans that lack basic data, such as how many workstations are required and addresses for where they're to be shipped. Yet the team is still held to its deadlines.

"I have people coming to me in tears, asking when will management start following the contracts," the project manager says. "It's killing me."

Poor or nonexistent communication from management and failure to protect IT employees from unreasonable deadlines and project requirements are huge sources of frustration.

"It's total chaos. There's no communication, so no one knows what anyone else is doing," says Michelle Goodrich, an IT specialist in Sacramento, Calif. She's working on a Web-enabled application meant to interface with a database, but no one has set standards for front ends or for the database interaction. "So I'll pick my pieces, and another group may be picking its own," she says.

A senior programmer/analyst working on a government contract says he left one job because his technically adept boss continually changed job specifications without telling him, so most of his work went unused. "That got real discouraging," he says.

Others say their bosses are technological novices, often in over their heads in trying to manage an IT department. "The whole plant knows not to go to the head of IT when they need something but to find one of us instead," says a network technician at a manufacturing company in Louisiana.

Dissatisfied IT professionals say another thing that leaves a sour taste in their mouths is when their bosses don't share the glory. For example, staff at a firm in Illinois worked New Year's Eve and New Year's Day on Y2k issues. "Our IT director looked great, but we didn't get any recognition," says a network professional there. "They didn't even replace the lost holidays on our vacation schedule."

Despite the shift to a technology-based economy and the increase in value of IT skills, most unhappy IT workers say they don't see signs that their employers will make changes to keep them. "Lots of companies haven't woken up to the fact that their IT staff is most at risk for not showing up on Mondays," says a telecommunications manager in San Francisco.

But chances are good those IT staffers will show up *somewhere* on a Monday. "I've got an offer that will increase my salary by 20%," says the network professional in Illinois. "So I may go where they'll treat me well for at least six months before reality kicks in." ◗

Watson is a freelance writer in Chicago.

MORENEXT WEEK

This is the first installment in a two-part series about why IT professionals go and why they stay.
Next issue: Retention advice from the rank and file

■ EVERYTHING IS MY JOB
Too many projects to do, not enough time to do it. On top of the products, I end up devoting at least one-third of every day to solving issues for end users that they should know how to resolve on their own. These issues are skills that should be a prerequisite of their job. Add in the copy machines, fax machines and anything else that remotely resembles a computer (believe it or not, I was actually called once to fix the Coke machine) that I get calls to work on. . . . Well, I believe you may see the point.

■ SPINNING OUR WHEELS
There is very little room to branch out into new areas in my company. We are understaffed – which has led to a segregation of knowledge – and no one has time for cross-training types of activities. There are many more things that I could do and would be more than willing to learn to do, but there is no time to learn anything new.

■ WE'RE OUT OF CONTROL
On the whole, I am not in control of nor can I directly affect the environment I support. Developers – frequently contracters – write weak applications that cause general problems, which we then troubleshoot. Projects are late or DOA. My group doesn't fully participate in any development efforts but is called upon to fix errors when they are found.

■ START-UPS STARTING TO APPEAL
I am tired of the bureaucracy needed to accomplish the simplest tasks. There is too much time wasted on trivial issues while the world of technology passes by with the Internet. I can work harder and smarter in an Internet start-up than at a company filled with bureaucracy, attitude and pointless procedures. I feel I am wasting time here. There is so much more I can do outside this fixed structure.

KATHLEEN MELYMUKA/MS. MIS

From straw to gold — and back to straw

At the recent annual meeting of the Association of Women in Computing (AWC, *www.awc-hq.org*) in Orlando, attendees discussed how women can leverage the visibility and status many achieved as year 2000 project managers.

Although women make up about 20% of the IT workforce, best estimates indicate they handled 30% to 40% of Y2k projects. Ask a group like the AWC why that's so and you get a sea of knowing grins.

Early in the days when Y2k was considered a Cobol project, it was seen as a detail-oriented, dead-end job that would blow a career off its trajectory with no opportunity for advancement. The team would be made up of old-skills washouts. There would be no visibility, little intellectual challenge and no contact with the business.

It looked like a guaranteed lose/lose situation: If the project were to succeed, it would be perceived as easy. If it were to fail, the manager would be blamed.

In corporate parlance: women's work.

As the clock ticked, that initial view turned around. Executives recognized Y2k as the most difficult, most comprehensive, highest-visibility project in history. Many a lowly project manager suddenly found herself reporting to the board of directors.

Poetic justice, I call it. But this odyssey isn't over yet.

The fate of these business heroes is still unclear. AWC conference participants heard that, despite the success of Y2k projects, many Y2k managers are struggling to find a decent lateral move in the company. And many are getting no help whatsoever from the executives whose necks they saved.

And the Y2k effort itself has been forgotten. It seems that, rather than take advantage of the golden opportunity to leverage the benefits of Y2k work, many companies want to put it — and anyone involved in it — out of sight and out of mind.

So you've got Y2k managers who spent years learning about every division and department in their companies, who have a better global view and know more about the ins and outs of business processes than anyone else knows, who are poised to leverage their knowledge in enterprise resource planning implementations, supply-chain initiatives and global e-commerce — and whose companies just want them to disappear into the woodwork.

What a waste! And because women were overrepresented among Y2k managers, they're disproportionately hurt by this backlash.

Imagine how refreshing it was when one woman, Josee-Marie Griffiths (jmgriff@umich.edu), CIO at the University of Michigan, showed the group how a woman's touch can change the Y2k aftermath.

She talked about her appreciation of how her Y2k staff had "spun straw into gold," turning this lose/lose project into a win for the university. And she talked about how she as Y2k director had turned it into a win for herself and her people.

Griffiths won't allow the university to put Y2k behind it. She's projecting her view — a holistic woman's view — of the process by broadcasting her conviction that Y2k delivered a new, clear and comprehensive understanding of systems across the organization that was never possible before. She's a vocal, visible advocate for continually updating and building on that view, using that knowledge to develop new strategies and helping her business partners do the same.

KATHLEEN MELYMUKA is a *Computerworld* feature writer. Contact her at **kathleen_melymuka@computerworld.com.**

Women are known for valuing relationships, and Griffiths won't allow the university to forget what her Y2k people did. She kept their contribution before the entire population throughout the project, and when it was over, she published a full-page letter in the campus newspaper, describing the team's success in detail and listing the names of more than 100 people who contributed to the effort.

Women are great at bringing the theoretical right down to the kitchen table, and Griffiths refused to let anyone imagine that Y2k was hype. She brought its importance home to students, administrators and faculty when she published an article in the paper listing more than 60 student-related snafus — no course listings, no tuition calculations, no financial aid, no class lists — that would have occurred as the January term began if her Y2k team had not succeeded.

And most important, women are nurturing. Griffiths won't allow her Y2k people to recede into the background. She's encouraging them to use their comprehensive expertise to become involved in other organizationwide projects.

Griffiths' analogy is apt. If ever there was a project where straw was spun into gold, it was Y2k. But for many of the spinners — women and men alike — the reward has been more straw. Still, they spun it once and they can spin it again by following Griffiths' lead and refusing to go anywhere but up. "You've escaped the dungeon of compartmentalization," Griffiths tells her Y2k people. "Don't go back!" ◗

CONFERENCES

■ INFORMATION SECURITY IN AN E-BUSINESS WORLD
Sheraton New Orleans, June 5-7
Trends and technologies surrounding security on the Web.
Cost: $1,395 for Gartner Group clients; $1,695 for others
Contact: Gartner Group Inc. in Stamford, Conn., (800) 778-1997 or (203) 316-6757; fax: Ashley Pearce, (800) 778-1998 or (203) 316-6774
www.gartner.com/infosec/usa

■ E-PAYROLL
Westin Michigan Avenue, Chicago, June 5-7
Automating enterprisewide payroll functions.
Cost: $1,499
Contact: International Quality & Productivity Center in Little Falls, N.J., (800) 882-8684 or (973) 256-0211; fax: (973) 256-0205; e-mail: info@iqpc.com.
www.iqpc.com

■ WIN-DEV EAST 2000
Marriott Hotel, Cambridge, Mass., June 5-9
The latest in the world of development for Windows.
Cost: $595 to $1,695
Contact: Boston University Corporate Education Center in Tyngsboro, Mass., (800) 288-7246 or (978) 649-9731, ext. 255; fax: (978) 649-2162
www.win-dev.com

■ JAVAONE
Moscone Convention Center, San Francisco, June 6-9
Sun Microsystems Inc.'s annual Java developer conference.
Cost: $1,295 to $1,395 until May 31; $1,595 after May 31
Contact: ZD Events Inc. in Needham, Mass., (888) 886-8769; fax: (781) 449-2674
www.zdevents.com

■ THE SIXTH LEADERSHIP DEVELOPMENT CONFERENCE
Grand Hyatt, Washington, June 12-13
Tools and strategies for existing and future corporate leaders.
Cost: $1,095
Contact: Linkage Inc. in Lexington, Mass., (781) 862-3157; fax: (781) 862-2355
www.linkageinc.com/ldc2000

■ THE BEST OF TEAMS 2000
Chicago Marriott, June 12-15
Anything and everything about building and improving teamwork in today's corporations.
Cost: $1,095 to $1,295
Contact: Linkage Inc. in Lexington, Mass., (781) 862-3157; fax: (781) 862-2355
www.linkageinc.com/teams2000us

■ E-BUSINESS CONFERENCE AND EXPO
San Jose Convention Center, June 13-15
Insights, strategies and technologies for electronic business.
Cost: $595 to $1,395
Contact: CMP Business Forums in New York (800) 652-2578; fax: (212) 592-8233
www.ebusinessexpo.com

■ THE 2000 E-COMMERCE CONFERENCE
Hilton New York, June 15-16
Explore a wide range of e-commerce issues with several senior executives.
Cost: $1,425 for Conference Board members; $1,625 for others
Contact: The Conference Board Inc. in New York (212) 339-0232; e-mail: carol.courter@conference-board.org.
www.conference-board.org/ecommerce.htm

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The Recasting of Y2kers

While e-commerce and ERP work beckon for some, others feel overlooked for high-profile IT jobs after the date change. By Kim S. Nash

SOME YEAR 2000 managers and workers have parlayed their big-project skills into high-profile, strategic positions on e-commerce and enterprise resource planning projects.

But others have gotten sidelined in less exciting jobs or been overlooked for promotions or perks they thought they deserved.

And five months into the new year, some information technology staffers are still doing Y2k cleanup work, such as archiving code-fix procedures and writing recommendations on how to manage similar giant projects in the future.

"It's all over the map, what's going on with year 2000 people," says David Iacino, year 2000 program director at FleetBoston Financial Corp. in Boston. "Some stay, some want to try something different."

Of 129 Y2k workers polled by *Computerworld*, most — 108 — said they didn't get new positions after their Y2k stints. That is, if someone was a project manager before Y2k, he remained a project manager after Y2k — just on a different project. The majority of those polled said they are content with that, especially since their new gigs are often in hot e-commerce or enterprise resource planning (ERP) initiatives.

Even so, 19%, or 24, of the 129 Y2k workers, said they plan to look for new jobs.

Interestingly, survey respondents were just about split on whether year 2000 work made them more marketable (see chart, next page).

Of the 20 who are in new positions, 11 consider themselves demoted or moved laterally, the survey found. Only nine said they feel they were promoted.

A former Y2k manager at a company in the Northeast, who asked to remain anonymous, says she's disappointed with her post-year 2000 career.

"I got a good bonus and a reasonable salary increase and excellent review," she says. "But I've been demoted, for all practical purposes." She joined the company in 1998 as a senior IT manager. When she was asked to lead year 2000 remediation, she says, her managers gave her a verbal promise that a better position awaited her after Y2k. But that didn't happen.

As for others on her year 2000 team, most have made lateral moves within the company, while a few others have quit, she says.

That's frustrating, she says, especially because the people doing the work had to stretch their skills — and did so willingly. "People were asked to do things totally outside [the IT] field, like communicating with outside clients" about the remediation effort, she says.

Happy Ending

The post-Y2k story had a happier ending for Irene Dec, the former Y2k leader at The Prudential Insurance Company of America in Newark, N.J.

Dec, an 18-year veteran of Prudential, is now a vice president in the financial giant's international investments division. She was appointed to the prestigious technology slot to help grow overseas business for Prudential, and Y2k played a big part in landing her the job, she says.

In year 2000 leadership, "I had a very large project with a global scope. It was obviously a critical business need," Dec explains. "Those same things match up to [Prudential's needs in] international investments." Dec accepted the new assignment after being

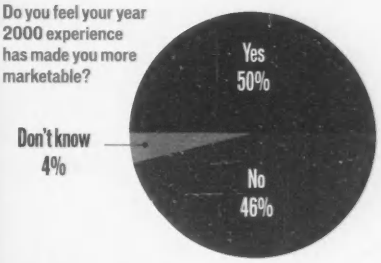
> "I'm absolutely thrilled and complimented that Prudential felt [that by] what I demonstrated on Y2k, I had the qualifications to move on to another high-profile role."
>
> IRENE DEC, FORMER Y2K LEADER, PRUDENTIAL INSURANCE COMPANY OF AMERICA

JULIE BIDWELL

After the Date Change

With their work mostly completed, former Y2K project managers and staffers are split on whether their experience has helped them in their careers. But many have moved on to other, higher-profile IT assignments.

Do you feel your year 2000 experience has made you more marketable?



Where is your primary job responsibility today? (Number of times the top six answers were mentioned)

Enterprise resource planning	20
Financial applications	14
Electronic-business infrastructure	10
Intranet/extranet	9
Infrastructure operations/coordinator	8
Customer service	7

SOURCE: COMPUTERWORLD SURVEY OF 129 IT PROFESSIONALS WHO WORKED PRIMARILY ON Y2K PROJECTS IN 1999

offered "a variety" of jobs inside and outside the company, she says . "I was interested in more of a focus on the business side of the house."

Dec took three of the 40 to 60 members of her year 2000 team with her; the others found slots in various areas throughout Prudential, she says.

"I'm absolutely thrilled and complimented that Prudential felt [that by] what I demonstrated on Y2k, I had the qualifications to move on to another high-profile role," she says.

The smartest CIOs are redeploying their Y2k people to strategic new ventures — e-commerce in particular, says Kazim Isfahani, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Fledgling e-commerce projects need the know-how of successful year 2000 managers, who can do such things as set achievable goals and make sure projects get the needed resources, says Isfahani. Y2k managers had to communicate in the language of the business side while understanding IT, he says. "It's a skill that's been developed that will foster better project communication in a shorter time frame, which is very important in e-commerce," he says. "Those skills are rare."

Steve Jost, a project manager at Deere & Co. in Moline, Ill., swapped his year 2000 cap for an e-commerce helmet — but stayed put at Deere. That is, he made a lateral move into a hot field.

One aspect of Jost's Y2k responsibilities — the daily contact he had with Deere's business-unit managers throughout the company's multinational operations — gave him an edge in his new role.

He calls on those people as he works to advance Deere's online activities, he says. Those personal relationships are helping him get the cooperation he needs for technology projects, he says.

Ed Hourihan is another IT manager who played Y2k roulette and won. To tackle Y2k chores at Phoenix Home Life Mutual Insurance Co., Hourihan decided to hire programmers in India to fix the company's code. Nothing unusual there.

But then Hourihan, along with Chief Technology Officer Satish Bangalore, added a twist. Enfield, Conn.-based Phoenix formed a new company with the Indian programmers: Phoenix Global Solutions in Bangalore. So, instead of a sunk cost, Y2k became a moneymaker.

How? Through the new Indian company, Phoenix has recouped its $25 million in Y2k costs and is expected to pull in another $25 million in extra sales this year, Hourihan says. He now manages the Indian company, whose 215 employees build call center and Web applications for other companies, including Prudential and IBM.

Phoenix Global Solutions plans to hire an official sales force this year. Meanwhile, everyone who worked on Phoenix Mutual's year 2000 project still has a job at the company, Hourihan says. "Not that we weren't on the radar screen with the CEO before, but certainly we're a bigger blip now," he says.

The Morning After

Yet for most folks, year 2000 fixing was a historic but uneventful career chapter.

"I went back to my day job," says Dave Kelble, an IT manager, who volunteered in 1996 to run year 2000 duties at Wawa Inc., a chain of convenience stores based in the Philadelphia suburb of Wawa, Pa.

"I'm just starting to get down to some of the projects that I left as orphans," Kelble says. Those include adding more of Wawa's suppliers to its electronic data interchange (EDI) network. He is also charged with investigating how to add Internet capabilities to the retailer's EDI system.

Many of the 12 Y2k contractors Wawa hired from service firms, however, didn't fare as well, Kelble says.

When Wawa's work was done, the service firm — which Kelble declined to name — laid those people off. "Many are out of jobs," he says.

Meanwhile, FleetBoston's Iacino is busily archiving the key procedures the bank used during remediation. "We're archiving to show due diligence in the — God forbid — event that we are faced with a legal matter" such as a suit by a customer claiming he was hurt by Y2k trouble at FleetBoston, he notes. (Iacino says the bank experienced no significant year 2000 glitches.)

FleetBoston is looking for positions for the rest of its 18-member Y2k team, but Iacino says he knows some are considering jobs at Internet companies. "We want to retain as much talent as we can, but ultimately, we can't chain our people to a desk."

He says he hopes to leverage the extensive knowledge of hardware and software that FleetBoston has gained from Y2k. One area in which it would be useful would be in negotiating with vendors. "We know today every piece of software we have and what platform it resides on and who the vendor is, for the first time ever," he says. "We could say, for example, 'We buy $12 million worth of software from you a year, so we think we should be getting a better deal.' "

Convergence

BY FRANK HAYES

NOT VERY LONG ago, convergence meant one thing in the information technology world: the merging of television and the Internet. Interactive TV and Web multimedia would collide, the pundits predicted, resulting in a new medium combining the best of both worlds.

That kind of convergence may still happen someday. But right now, some business consultants are using the term to describe a much more immediate process: merging different sales channels, distribution systems and product categories.

The basic idea is that business is no longer about how you sell or deliver the product, or even what you sell. It's about the customer. And as a result, all the channels that lead to the customer must converge.

DEFINITION

Convergence is a business shift in which two connections with the customer that were previously viewed as competing (such as bricks-and-mortar stores and the Internet) come to be seen as complementary. Those customer connections can include previously competing sales channels, product categories or distribution channels.

Coming Together

Case in point: Lands' End Inc., a retailer in Dodgeville, Wis., no longer sees its Internet and toll-free phone sales as competing. Instead, an Internet customer can click on a Web-site button and within 20 seconds talk to a customer service representative who can feed personalized images to the customer's Web browser.

"The customer is at the center of everything we do — [mail-order] catalogs, the Internet, our [toll-free] number," says Sam Taylor, Lands' End's director of e-commerce.

But convergence is still a work in progress.

"Ideally, you want all the channels to know what all the other channels know," says Marc Singer, a principal at McKinsey & Co. in San Francisco and co-author of the book *Net Worth*. "You want it personalized for each case. That was hard before the Internet, and the Internet has made it harder. But people are taking the next set of steps."

Some steps are deceptively simple, Singer says. For example, Round Rock, Texas-based Dell Computer Corp.'s Web site "lets you pretend you're configuring your own computer, then talk to an adviser to make sure it makes sense," he says. At Gap.com, "I can buy something online and give it as a gift. If it's not right, [the recipient] can return it at a Gap store, and the clerk won't say 'You bought it online, you can't return it here,' " adds Singer.

But convergence isn't just about selling; it can also be found in distribution channels. Some record companies are beginning to sell music as downloadable MP3 files and compact discs. And traditional book publisher Charles Scribner's Sons recently began selling a Stephen King horror story, "Riding the Bullet," as a downloadable online book.

Convergence isn't tied to the Internet — or even new. Although Seattle-based Amazon.com Inc. can track book purchases to offer other merchandise, such as toys and hand tools, New York-based Barnes & Noble Inc.'s bricks-and-mortar bookstores sell lattés, videotapes and other products tied to customers' lifestyles.

As a business process, convergence isn't simply a matter of installing new IT systems to link Web sites with service representatives. "It's a fundamental change in the rules of economic activities," says Douglas F. Aldrich, a managing director at Chicago-based A. T. Kearney Inc. and author of *Mastering the Digital Marketplace: Practical Strategies for Competitiveness in the New Economy*.

In the past, Aldrich says, companies concentrated on manufacturing their products, and the supply chain fed that process. But that was when regional distributors had strongholds on their markets. Now, customers can shop globally on the Internet, relying not only on distributors but on nontraditional retailers, or even purchasing direct from the manufacturer.

So the supply chain has turned into a demand chain, with the focus on the customer.

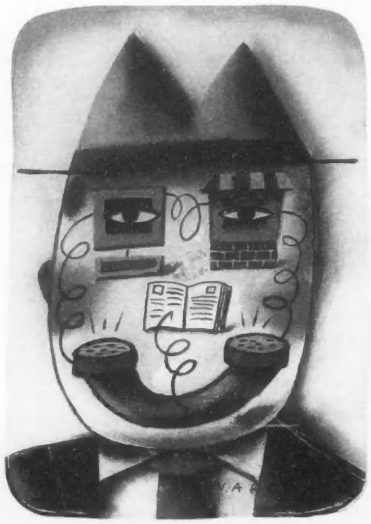
Converging Around the Customer

For businesses to succeed, all channels must converge, with the customer at the center:

Sales channels:
- Web stores
- Bricks-and-mortar retail stores
- Mail-order catalogs
- Telemarketing

Product categories:
- Print ads, TV commercials, Web sites
- Dissimilar products that may appeal to customers based on demographics
- Dissimilar products that may appeal to customer based on interests expressed in purchases

Delivery channels:
- Physical delivery
- Electronic delivery



KURT JARSEN

AT A GLANCE

Real-World Convergence

Sales channel convergence
- Gateway begins as telemarketer, opens retail stores
- Barnes & Noble starts as retail bookseller, adds Web store

Product category convergence
- Barnes & Noble sells lattés to book customers in retail stores
- Amazon.com sells tulip bulbs, tools or toys to book customers on Web site

Delivery channel convergence
- Record label EMI sells new recordings on CDs (physical delivery) and as MP3 files (electronic delivery)
- Book publisher Scribner's sells Stephen King books (physical delivery) and a short story by King, "Riding the Bullet" (electronic delivery)

The result is "the convergence of what were distinct markets and channels," Aldrich says. "There's no longer any customer loyalty. Now the customer asks, 'How do you become loyal to me?' "

That means more than simply adding enterprise resource planning systems or supply-chain management; it means one-to-one marketing for every customer.

At Your Service

"It's easy to say you need a fundamental rearchitecting," says Singer. But it also requires rethinking the whole approach to doing business. "What, on the customer dimension, makes the experience better? he says. "And for the seller, which things have a chance to break even or make money and give you the benefits of customer conversion or retention?"

Does convergence translate into a return on the investment? At Lands' End, which has made a heavy commitment to merging its sales channels, the answer seems clear: More customers buy.

"We have a significantly higher checkout rate on our Web site," says Taylor. "For the industry as a whole, two-thirds of shopping sessions are not completed. For Lands' End, more than 50% are completed."

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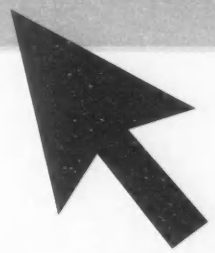

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JOE AUER/DRIVING THE DEAL

Contracts should also cover 'change control'

IF YOU CHANGE SOMETHING in a deal with an existing supplier, you could have a challenge on your hands. Unfortunately, many IT customers don't anticipate these changes very well, if at all. And when they don't anticipate and manage changes, vendors' profits skyrocket.

Interestingly, vendors are known to lowball customers who are perceived to be contractually naive. The vendors know they'll be able to maximize profits later by taking advantage of dependent customers when changes occur.

Change today is rapid and certain. New products and capabilities are being pitched in record numbers by vendors to customers; projects change dramatically to incorporate new ideas and technology; service and software deals need to be adjusted for new types of users, volumes and service levels.

Speed and change are driving today's marketplace. Since no one can predict all potential changes, customers and vendors should at least agree ahead of time on a rational process for handling changes when they occur.

The underlying premise of a good change-control process is that the customer must be able to assume there will be no changes in the vendor's quality, timeliness or cost unless the vendor includes suggested changes in a contract amendment that the customer can accept. The customer must ensure that these proposed changes don't undercut the original contract's benefits or inject ambiguity and uncertainty into the relationship — which would be certain to increase the likelihood of disputes and mistrust between the parties.

Your change-control process should cover five areas:

- A method for either party to suggest a change, along with the information to be included in a request (a "change form" is a good idea).
- The parties to whom the change should be submitted.
- The time period for reviewing the change request.
- The process and deadlines for revising the change request.
- The process for approving and implementing the change, such as through a change order or a new or revised statement of work.

There's no single approach to these types of problems. Customers need to take into account each deal's unique characteristics to determine the right approach. But whatever methodology you choose, it must be based on the premise that the change-in-the-deal provision was designed to keep the project moving toward a successful conclusion.

Just in case the vendor and customer can't agree on the need for a suggested change or its impact on the project's timetable, price or performance standards, the contract should include a mechanism for resolving differences.

Depending on the state of the project and how critical the proposed change is, an interim mediation or arbitration mechanism can be used. If this isn't practical, then the customer usually should have the right to tell the vendor to proceed with the changes but should reserve the right to challenge the vendor's proposed changes to the timetable, price or performance standards later.

JOE AUER is president of International Computer Negotiations Inc. (*www.dobetterdeals.com*), a Winter Park, Fla., consultancy that educates users on high-tech procurement. ICN sponsors CAUCUS: The Association of High-Tech Acquisition Professionals. Contact him at joea@dobetterdeals.com.

In many instances, the only dispute relates to price. As long as the vendor's interests are adequately protected — such as by providing payment for the changes under the same mechanism that applies to the original contract, but under protest — it's often possible to defer resolution of the payment dispute until the project has been completed.

But sometimes, the changes may be so significant that an earlier resolution is required. In that case, include provisions that might require interim mediation or arbitration, like the following:

- Disputed changes that have more than a moderate impact on the project timetable (that is, they prompt a delay of several days in the completion of one or more milestones).
- An increase in the project's price exceeding a specified percentage or dollar amount.
- A significant drop in performance standards based on selected elements.

While a solid contract and a program to manage it are keys to a successful deal and a customer/vendor relationship, they aren't enough if they don't contain processes for change control. Change is inevitable — and both parties must prepare for it by developing and following ways to deal with it. ◗

BRIEFS

MP3 Signs Deal With Music Label

MP3.com Inc., which was recently found liable for having violated copyright law, claimed a small victory last week in its battle for legitimacy.

The San Diego-based company announced that it had reached a licensing agreement with New York-based music distributor Broadcast Music Inc. (BMI). The agreement will let MP3.com offer a library of as many as 45 million BMI songs from its site.

The license doesn't cover the copyright for a specific recording of a song that is owned by a record label, according to an MP3.com official who asked not to be named. It does cover versions of the songs recorded by the artist but never specifically sold to a label or another party, however.

E-Commerce Set To Explode in U.K.

Online retailing in the United Kingdom should experience sustained growth during the next five years, with shoppers forecast to spend £20 billion ($30.5 billion) on purchases made over the Internet in 2005, Fletcher Research announced at its Retail Online forum last week.

The report, "U.K. Online Retail: From Minority to Mainstream," forecasts that by the end of this year, £1.7 billion will be spent by consumers in the U.K. on "e-shopping." The online leisure travel market will account for £490 million of the projected revenue total for 2000, with the computer product market hitting sales of £410 million this year, said Shobhit Kakkar, an analyst at Fletcher.

Gates: Firms Should Use Smart Cards

In a trade show keynote speech last week, Microsoft Corp. Chairman Bill Gates touted smart cards as tools that can improve security, especially on Windows machines. Microsoft announced last week that five manufacturers will build Windows smart cards for network authentication, securing corporate transactions and other uses. Gates also referred to the "I Love You" worm filling up his e-mail: "It's like an IQ test – am I going to open it or not?"

Sony Shifts Leaders

Sony Corp. last week announced top-level executive changes designed to help the Tokyo-based company perform better in the New Economy. Executive Vice President Kunitake Ando was promoted to the position of president and chief operating officer. Current President and CEO Nobuyuki Idei will retain the CEO position and become the company's chairman.

Jitong Opens Network

Jitong Communications Ltd., operator of one of China's major data networks, plans to offer access to U.S. companies for services such as virtual private networking, frame-relay service, and voice over IP. The World Tone service, to be launched next month, will let companies use Jitong's Golden Bridge network. The firm said the network links 12 cities in China with high-capacity connections.

Directech/eMerge Names New VP

Peter Sutters has been named vice president of account services at Directech/eMerge, a Lexington, Mass.-based direct and online marketing agency. Sutters has more than 20 years of direct marketing experience. He most recently worked at Amergent in Peabody, Mass., where he started as director of business development and then was vice president of commercial marketing.

Keynote Systems to Purchase Velogic

Internet performance-monitoring vendor Keynote Systems Inc. in San Mateo, Calif., last week announced that it's buying load-testing service provider Velogic Inc. in Sunnyvale, Calif., for $50 million. The Velogic service lets Web site developers load-test hardware and software to determine application performance before deployment on the Web. Keynote's service measures Internet performance, with prices beginning at $295 per month for monitoring one Web site address.

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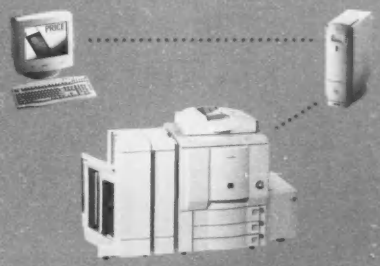

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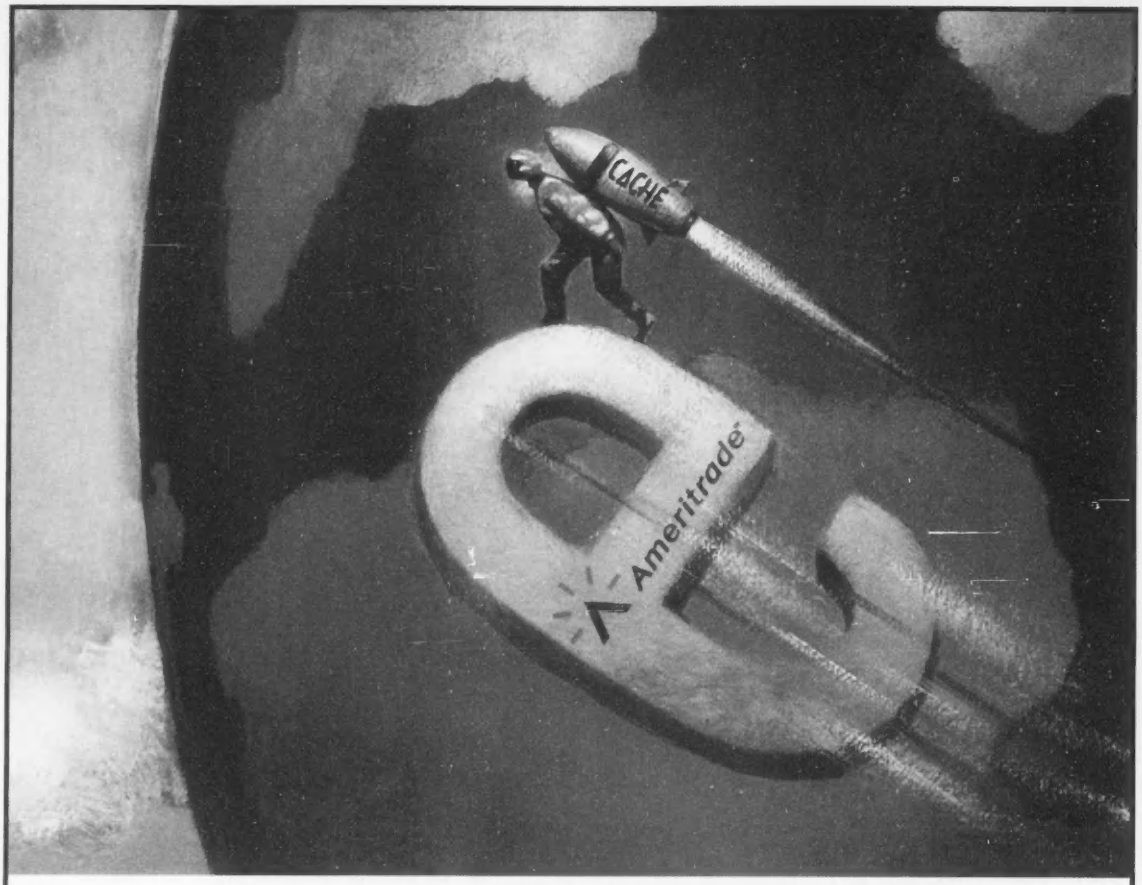

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TECHNOLOGY

HOW'S IT GOING?

System managers need to get a customers'-eye view of how their Web sites are performing. Vendors are coming out with tools to deliver such information, but no single tool can do it all — and some of the tools out there are pricey. ▸ 65

SECURE LAPTOPS

Intel is looking to set a new standard for notebook computer security, with an architecture that requires user authentication before the computer even boots up. The aim is to make a stolen laptop about "as valuable as a brick," says an Intel spokesman. ▸ 66

YOUR FATHER'S MIDDLEWARE?

Convinced that they can teach old networks new tricks, middleware vendors have unveiled a new round of products with XML capabilities and user-friendly tools to allow nonprogrammers to customize applications. ▸ 67

SECURITY JOURNAL

Our fearless security manager finds out just how important all those labels on a network interface card are, yearns for more Windows 2000-compatible software and asks for help in keeping a switched network secure. ▸ 68

QUICKSTUDY

SQL is the fundamental tool for getting data into and out of relational databases. It's now so fundamental to accomplishing work involving a database that virtually every application or development tool ends up translating queries and other commands into SQL. ▸ 70

FUTURE WATCH

Ethernet is about to make its next quantum leap to 10G bit capacity. The potential for moving large quantities of data at hyperspeed is enormous. Senior writer Gary Anthes explores the topic in the first of our weekly installments on leading-edge technologies. ▸ 73

DATA PROTECTION

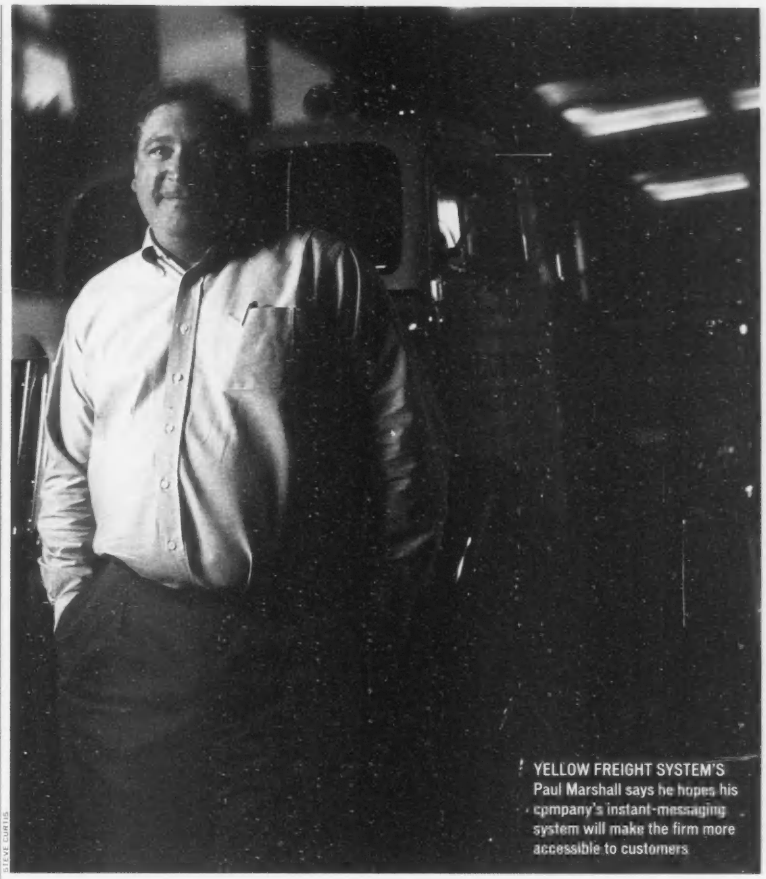
The smallest e-commerce site offering personalized content has one thing in common with the biggest business-to-business online marketplace: the need to give specific users access to discrete portions of behind-the-scenes data. Application-level security can give customers access to only the data they need. ▸ 76

BUYING POWER

Newcomer iPin takes aim at an area where e-commerce sites lag behind bricks-and-mortar retailers: purchases of less than $20. Check out this firm and its competition in the micropayment market. ▸ 78

IT OASIS

Not all dry land and desert, Phoenix is a hotbed of economic activity, with a growing population and low unemployment. ▸ 80



STEVE CURTIS

YELLOW FREIGHT SYSTEM'S Paul Marshall says he hopes his company's instant-messaging system will make the firm more accessible to customers

E-COMMERCE GETS THE MESSAGE

INSTANT MESSAGING can be a valuable business tool, especially in e-commerce. In fact, it may be the best and most natural way for a company to provide direct, real-time service to a Web site visitor who has a question, is lost or has special needs. It adds a flexible, comforting, human touch to an otherwise automated process. Now, if only everyone could agree on a standard.

74

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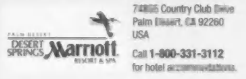

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CONFERENCE AGENDA

Sunday, June 18, 2000

12:00pm - 5:00pm
Registration

7:00pm - 9:30pm
Pre-Conference Networking Reception

Monday, June 19, 2000

8:30am - 9:00am

Welcome and Opening Overview
Maryfran Johnson, Editor-in-Chief
Computerworld

9:00am - 9:45am

Opening Keynote: "IT Leadership vs. E-Leadership"
Charlie Feld, E-Leader and former CIO, Delta Airlines
CEO, The Feld Group

10:00am - 11:30am

"The Naked Truth About B2B E-Commerce"
Kevin Fogarty, Business Editor
Computerworld
Moderator
Panelists:
Robert Schwartz, VP & GM, Panasonic Corp. • Kathy Brittain-White, CIO & EVP, Cardinal Health (cardhealth.com) • Peter Burrows, CTO, Reebok International • John Keast, CIO/CTO, Raytheon • Bruce Carver, VP of International Management and Technology, Reynolds & Reynolds

11:30am - 12:15pm

Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"
Eric Singleton, Director of Global E-Business
Raytheon

12:30pm - 1:45pm
Interactive Luncheon with IT Leaders

2:00pm - 3:30pm

"Enterprise Security: Will Only the Paranoid Survive?"
Priscilla Tate, President
Technology Managers Forum
Moderator
Panelists:
Scott Charney, former head of computer crime investigations, U.S. Department of Justice and now Partner, PricewaterhouseCoopers • Allan Paller, Columnist, Computerworld and Research Director, SANS • Tim Talbot, VP of Technology Management, PHH Vehicle Management Service

3:30pm - 4:15pm

Afternoon Keynote: "Innovation & Change"
Thornton May, VP of Research
Cambridge Technology Partners

4:30pm - 5:30pm
Premier Sponsor Breakout Session 1
Palm Mobile Solutions Session

5:30pm - 8:30pm
Expo Open and Reception/Buffet Dinner

Tuesday, June 20, 2000

8:45am - 9:00am
Remarks and Day Two Overview

9:00am - 9:45am

Keynote
David Lord, CEO
Toysmart.com

10:00am - 11:30am

"ASPs: The Double-Edged Sword of Outsourcing"
Mark Hall, West Coast Bureau Chief
Computerworld
Moderator
Panelists:
Dick Hudson, CIO, Global Marine • John Voeller, CKO, CTO & SVP, Black & Veatch • Satoesh Lele, President, Lele Consulting Group • Tsvi Gal, CIO, CTO & VP of Mergers and Acquisitions, GBS • Mark Mathias, President, Eureka Digital • James Lubinski, EVP, Galileo International

11:30am - 12:15pm

Featured Speaker
Peter Solvik, CIO
Cisco Systems

12:30pm - 2:00pm
Buffet Lunch and Expo Open

2:00pm - 3:30pm

"Walking the E-Customer Tightrope"
Julia King, Senior Editor
Computerworld
Moderator
Panelists:
Cathy Hotka, VP, National Retail Federation • Joseph Smialowski, Vice Chairman, Fleet Boston Financial • Robert Rubin, CIO, Elf Atochem North America • Manoj Tripati, CIO and Vice President, Jamba Juice

3:30pm - 4:15pm

Insider View: "Taking Care of E-Customers at Autobytel"
Ann Delligatta, COO
Autobytel.com

4:15pm - 5:15pm
Premier Sponsor Breakout Sessions 2 and 3

5:15pm - 7:00pm
Expo Open and Reception

7:00pm - 9:00pm

Premier 100 Awards Presentation and Gala Dinner
Featured Keynote: Jim Yost, CIO
Ford Motor Company

Wednesday, June 21, 2000

8:45am - 9:00am
Remarks and Closing Day Overview

9:00am - 10:30am

"How to Win the Hiring War Between the 'Dots' and the 'Nots'"
David Weldon, Careers Editor
Computerworld
Moderator
Panelists:
Irene Dec, VP of International , Investments, Prudential Insurance Co. • Margaret Schweer, HR Director, Kraft Foods • Robert Bruce, CIO, Allmerica Financial • David Foote, Managing Partner, Foote Partners LLC • Jim Prevo, CIO, Green Mountain Coffee • Fran Quittel, Columnist, Computerworld

10:30am - 11:15am

Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"
Peter Keen, Author, *The eProcess Edge*, and Chairman
Keen Education

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How's My Site Doing? There's No Easy Answer

New tools give a customers'-eye view of site performance, but they are pricey

BY SAMI LAIS

SYSTEMS MANAGERS know what it takes to keep revenue-generating Web applications working: proactive monitoring of all the software, databases and infrastructure that affect them.

The question is, How? The dream is to have one tool, said Glen Schulze, quality assurance manager at PHH Vehicle Management Services in Hunt Valley, Md. But no single product can do it all — and some tools on the market are pricey.

"We're tracking around 75 products" in the Web-performance space, said Herb VanHook, an analyst at Meta Group Inc. in Stamford, Conn.

Among the new offerings is SiteAngel 2000 from Evity Inc. in Austin, Texas, which was bought this month by BMC Software Inc. in Houston. BMC offers Web site monitoring as a stand-alone service. Users of BMC's Patrol 2000 monitoring software can also integrate the SiteAngel data with network and application monitoring data collected by Patrol.

Each copy of SiteAngel monitors one transaction, which can comprise up to 50 steps, such as requesting a Web page and authorizing a credit card. As part of SiteAngel, BMC generates the sample transaction against the customer's Web site every 30 minutes.

At American Express Financial Advisors Inc. in Minneapolis, SiteAngel "lets me and my colleagues get a snapshot view of performance that was unavailable before," said Spenser Segal, Amex's vice president for e-commerce strategy. "It's not the comprehensive, definitive end-to-end answer, but that doesn't exist."

SiteAngel "presents the data from a business perspective in a way you can quickly explain to a senior executive," Segal said. "In two minutes or less, I can show them how to get a quick perspective [on Web application performance] that will tell them, 'Should I worry about this or not?'"

Carmello Lisciotto, network operations and security director at Ubid Inc. in Chicago, also uses SiteAngel. "It's not just some external agent checking for uptime and downtime. It really mimics the actual user experience," he said.

Pricing starts at $6,000 annually for one SiteAngel license.

Application hosting company Bitlocker Inc. uses Sunnyvale, Calif.-based Mercury Interactive Inc.'s ActiveWatch Web application monitoring service. ActiveWatch is based on Topaz, Mercury's Web application monitoring software.

Deanna Falcon, director of customer care and quality assurance at Palo Alto, Calif.-based Bitlocker, said she evaluated "everything from software that just pings your site to very sophisticated suites."

Falcon said Topaz provides information such as when a transaction takes longer than it should, and it "gives us a way to offer proof to our [customers] on how their applications are doing," she said.

Users of Topaz can define a test transaction and how often the test transaction should be executed. Topaz emulates the transactions from 40 to 50 sites in metropolitan areas.

Bitlocker has a two-year contract under which it pays about $2,000 per month for reports on five transactions running every 15 minutes from eight locations, Falcon said.

Topaz can help in stress-testing a site by, for example, simulating 50 users who all have different passwords and who all try to access dynamically personalized pages at once, said a Mercury spokesman.

Hewlett-Packard Co. has teamed with Keynote Systems Inc. in San Mateo, Calif., for another network-centric view of Web application monitoring.

Keynote's Perspective service offers data collected every 30 minutes on simulated transactions generated from up to 400 PCs at 50 sites, comparing the client's site performance with that of 50 top business Web sites. Through HP's partnership with Keynote, subscribers to HP's service can see Perspective data integrated and correlated with data from HP's OpenView network monitoring tool on one screen.

Amex is also a Keynote client, Segal said. "It gives a different perspective," he said. "It's more robust [than SiteAngel] in that it monitors from lots of locations, but less robust in that it doesn't go every minute or two," he said.

Cost Concerns

Keynote's service starts at $295 per month for monitoring of one URL, a Keynote spokeswoman said. But added options can quickly swell the bottom line, said Meta Group analyst Corey Ferengul.

"Keynote is expensive — we have clients paying nearly $10,000 a month," Ferengul said. But the comparatively low cost of competing tools such as SiteAngel should bring prices down, he said.

Keeping tabs on performance is too big a job for one tool, Lisciotto said, so "we also use RedAlert [Web site and network monitoring service from Internet Resources Group in Dallas] and Patrol with Compaq Insight Manager."

PHH, a subsidiary of Garden City, N.Y.-based Avis Group Holdings Inc., uses several tools, including internally developed scripts, to monitor its Web applications and the infrastructure that supports them, Schulze said.

When a manager evaluates the options, Schulze said, he should ask:

- Does this tool offer adequate coverage?
- Does it tell us enough about our customers' experience early enough to let us act swiftly and plan accordingly?
- Does it let us be proactive?
- Does it let us analyze trends so we can make good decisions about how to enhance our architecture?

"If there's a tool or suite of tools that lets you answer, 'Yes,' I'd say you've got what you need," she said.

The question of which package — if any — emerges as the leader will "come down to who understands how to integrate the tools, correlate the data and extend the capabilities of users' existing software," said Stephen Elliot, an analyst at Gartner Group Inc. in Stamford, Conn. "For today, it's still left to the end user to correlate the data," Ferengul said. But companies such as "HP and BMC have the potential to change the playing field," he added.

BMC SOFTWARE INC.

SITEANGEL/PATROL

Pros
- Repeatable synthetic transactions offer consistent results for performance comparison
- Tight integration between products
- Tracks dynamically changing transactions
- Inexpensive

Con
- Actual transactions can differ from synthetic ones

HEWLETT-PACKARD CO./ KEYNOTE SYSTEMS INC.

VENTURE/PERSPECTIVE

Pros
- Service status eases demands on internal IT staff
- Offers multiple transaction-generation sites to measure Internet infrastructure performance

Con
- Expensive

MERCURY INTERACTIVE INC.

TOPAZ

Pro
- Many availability options: Integrated in Tivoli tools, bought as stand-alone or part of ActiveWatch service

Con
- Few transaction-generating sites

Others on the Alert

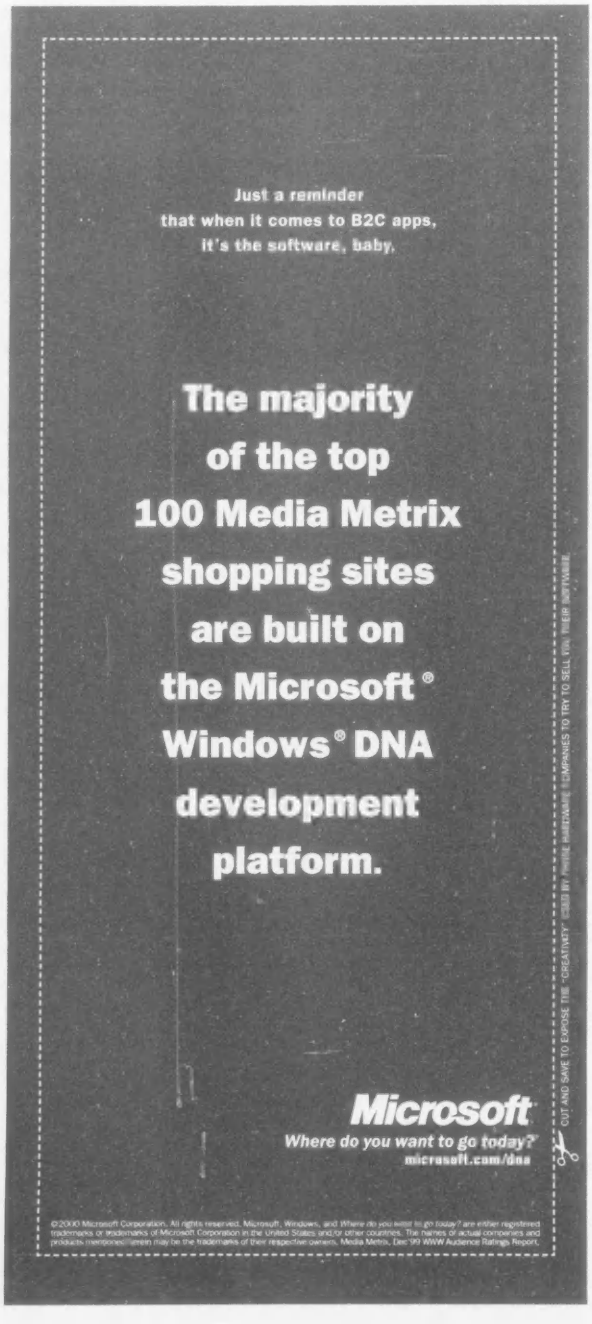
Some other players in Web application monitoring:

- **CompuWare Corp.**'s EcoTools uses software probes to automatically detect and identify devices on the network. Agents on specific PCs use request-and-response messages to monitor application availability.
- **Concord Communications Inc.** this year bought FirstSense Software Inc. and integrated that company's application-performance monitor with its NetworkHealth network monitor and rebranded the resulting suite as eHealth. It gathers data on application performance and provides detailed reports on resource use over time.
- **Mission Critical Software Inc.** this year bought NetIQ Corp. and Ganymede Systems Inc. NetIQ's AppManager monitors application server performance. Mission Critical's OnePoint is a directory and network availability tool. Ganymede's Pegasus does passive and active network and application monitoring and reporting.
- **DeskTalk Systems Inc.**, which licenses FirstSense tools in its Trend Web-based performance analysis and reporting software, this year collaborated with Ganymede on a ReportPack module that imports and correlates Ganymede data in Trend.
- **Lucent Technologies Inc.** last year bought International Network Services and wrapped INS's tools into its NetCare services division. INS bought VitalSigns in 1998 and integrated that company's desktop agent, which tracks user transactions, into its network monitoring software.
- The network-focused **NetScout Systems Inc.** products use probes for monitoring application flows and response time. – *Sami Lais*

Intel Standard Aims to Tighten Notebook Security

BY JAIKUMAR VIJAYAN

Intel Corp. is looking to set a new standard for notebook security with a proposed architecture that requires that a user's identity be authenticated before the computer even boots up.



Since March, the company has been quietly trying to persuade hardware and software vendors to adopt its Intel Protected Access Architecture — a blueprint for preboot user authentication capabilities on mobile PCs.

Notebooks supporting the capability will require users to identify themselves via biometric devices such as fingerprint scanners before the operating system is loaded. Most current authentication procedures are done only after the boot process is completed and the operating system is loaded.

'As Valuable as a Brick'

Preventing the operating system from loading means unauthorized users are effectively shut out of the system, making a stolen notebook "as valuable as a brick" to thieves, said Robert Fan, a platform marketing manager at Intel. Intel's specification defines the interface and method that vendors of BIOS software — software that helps a machine's hardware communicate with the operating system — and vendors of biometric security devices can use to support this capability, said Naveen Musinipally, a product manager at Intel.

Intel isn't the first to attempt this. Verdicom Inc., fingerprint-authentication technology maker that was involved with Intel in developing the new specification, is working with notebook vendors to offer a similar preboot authentication capability.

Intel's specification will provide a standard way for authentication devices to interface with the PC in the future, Musinipally said.

Available Early Next Year

The first notebooks featuring the capability should become available early next year, Musinipally said. Intel will provide development kits, reference designs and technical information to help vendors enable the technology.

Intel's effort comes at a time when notebook theft is posing a growing security problem, said Mike McGuire, an analyst at Dataquest in San Jose.

> Intel's is an interesting approach to [laptop theft], an issue that's been a quiet little secret.
>
> MIKE McGUIRE, ANALYST, DATAQUEST

In one recent example, the U.S State Department announced that the FBI is investigating the disappearance two months ago of a laptop that might contain highly classified material. In March, a laptop containing sensitive data about Northern Ireland was stolen from an agent of Britain's MI5 internal security bureau.

319,000 Thefts

And 319,000 laptops were stolen in the U.S. last year, according to estimates from Safeware, The Insurance Agency Inc. in Columbus, Ohio.

"Intel's is an interesting approach to an issue that's been a quiet little secret," within companies, said McGuire, referring to laptop theft. Requiring authentication at the preboot stage "is the most logical way of protecting the data on a notebook," he said.

Here's how it works: Notebooks that support the capability will require users to authenticate themselves once the processor, chip set, memory and other platform components have been initialized.

Users can authenticate themselves using fingerprint scanners, smart cards or even standard passwords. The information input via such means is compared against data stored in a separate protected memory location on the computer.

Once the user has been authenticated, a software "key" stored in the protected area unlocks the hard disk drive and operating system.

But the specification does little to address the crucial need to protect existing mobile assets, said Eric Hemmendinger, an analyst at Aberdeen Group Inc. in Boston.

"If you are worried about the problem today, there are a number of solutions in the market — some of which are public key-based, some of which are smart-card-based" — that provide users with a way to protect data on their laptops, Hemmendinger said. Examples include technologies such as Pretty Good Privacy, he said.

AT A GLANCE

Laptop Protection

How Intel's Protected Access Architecture works:

- **Boot**
  CPU, memory, chip set and other components are initialized.
- **Authentication**
  User authentication data, such as a fingerprint, is captured via biometric devices and compared against data kept in a protected storage area.
- **Unlock**
  Upon authentication, a "key" is retrieved from the protected storage area and is used to unlock the hard disk drive and the operating system.

SOURCE: INTEL CORP

Vendors Try to Make Middleware More User-Friendly

BY MICHAEL MEEHAN

Convinced they can teach old networks new tricks, middleware vendors have unveiled a new round of products with XML capabilities and user-friendly tools designed to allow nonprogrammers to customize applications.

IBM last month launched MQSeries Version 2, the latest version of the company's messaging software, which links applications running on disparate platforms. The new version adds a translator for the content-tagging language XML. IBM claims the translator will make it easier for MQSeries to exchange data with the growing number of XML-based corporate portals.

Hoping to make MQSeries easier to manipulate and deploy, IBM added a visual tool that it said allows nonprogrammers to create business rules and application interfaces to MQSeries without having to write code.

"It's all very draggy-droppy, pointy-clicky types of things, but you don't have to write a line of code," said Rob Lamb, IBM's director of product marketing for business integration.

AT A GLANCE

What's New in MQ?

IBM's MQSeries Integrator Version 2 was released last month with some new features:

- XML support, designed to automatically transform messages from existing applications to XML-based applications.
- A graphical user interface that allows nonprogrammers to create new business rules and transformations without writing code.
- New HTTP support, which wraps TCP/IP MQ messages in HTTP, allowing those messages to pass more easily through Web firewalls.
- A built-in library of processing components that can be linked with third-party vendors to enable business integration.

Easier Integration

Gerry Fitzgerald, director of global messaging at Philadelphia-based pharmaceutical giant SmithKline Beecham Corp., has been using such features to reconfigure MQSeries for SmithKline's merger with U.K.-based Glaxo Wellcome Inc. He plans to use MQSeries to link SmithKline's J. D. Edwards OneWorld enterprise resource planning system with Glaxo's SAP AG system.

Meanwhile, MetiLinx Inc. in San Mateo, Calif., released its Enterprise 2.0 middleware with an algorithmic routing system designed to boost the scalability of applications that use it. MetiLinx was recently spun out of Mariner Systems Inc. in Boulder, Colo., which designs and maintains databases in the commercial shipping industry.

Although his company lacks the clout of IBM, MetiLinx CEO Carlos Collazo said he believes customers will increasingly look to middleware to boost application performance without expensive upgrades to servers or networks.

The company released its first multitier middleware last fall and rolled out a new version May 1.

Intelligent Routing

According to Collazo, the company's middleware uses an algorithm to route activity more efficiently among the user interface, business logic and database tiers of an application.

The result is improved transaction speeds and crash protection, he said. "This not only monitors the system but does something about it," Collazo said.

Partnered with professional services company Ernst & Young International in Dallas, MetiLinx has helped build an online teaching system for Cisco Systems Inc. in San Jose.

"Cisco's system is pushing through 1GB an hour [through its NT server network]," Collazo said.

"It makes us scream out there; the site just flies," said Mark Bockeloh, an Ernst & Young partner in charge of technology for the company's electronic-learning systems.

MetiLinx connects the application logic and database layers of the online educational application. In the near future, Bockeloh said he plans on using MetiLinx to also connect the application and interface tiers, which, he said, would boost throughput 30% to 40%.

"We had this great application, but we weren't able to provide predictability," Bockeloh said. "Now we've got that, along with manageability and scalability." The network runs more efficiently than originally planned, with only 80 of the initial 100 servers in use.

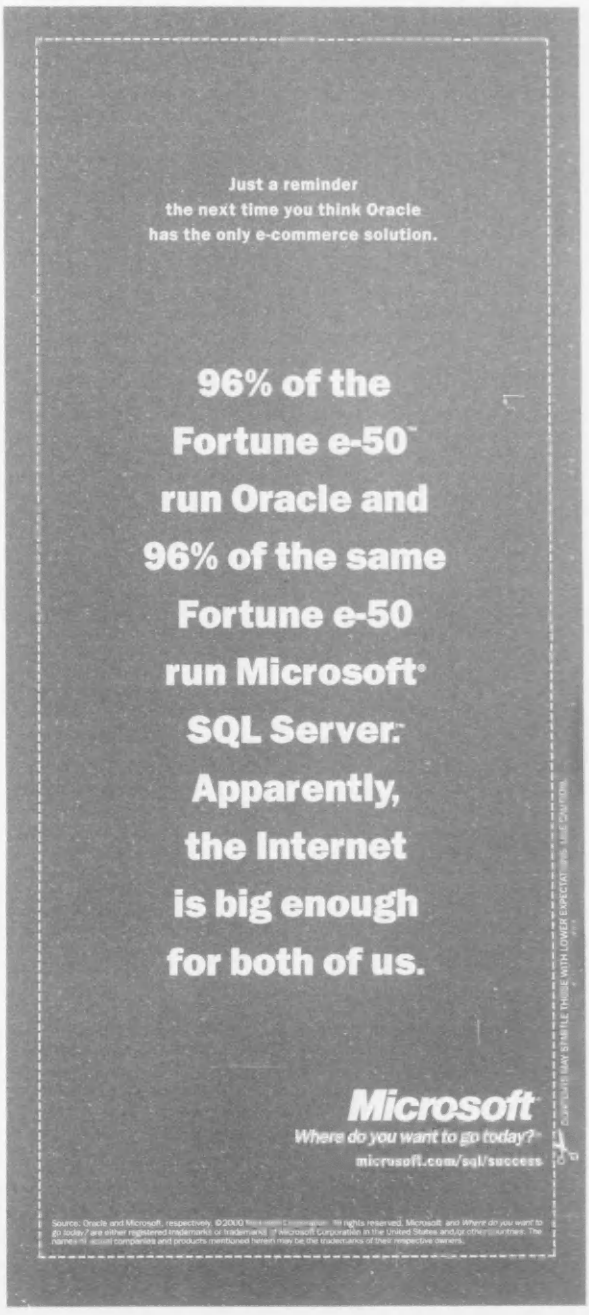
Collazo said middleware will allow companies to avoid the "brute-force method" of adding hardware every time a system problem occurs. The goal of MetiLinx is to create those efficiencies by working in every tier of a corporate system without bogging down either servers or networks, he said.

"It doesn't create a layer and force all the other technologies to pipe through it," Collazo said. "If it's just another application built on the same components, then you inherit the inefficiencies of those components. We're looking to eliminate those inefficiencies."

Consistent Look and Feel

Lamb predicted that more and more customers will need a consistent look and feel to their applications, driving the need for middleware. As XML and application programming interface standards begin to form in the middleware market, Lamb said he envisions the emergence of a less-proprietary IT world — especially with the current pace of corporate mergers and business-to-business partnerships.

"It's increasingly difficult to be integrated with another company if you yourself are not integrated internally," he said. "That in itself will likely become a standard."



For Want of a Label, The NIC Was Lost

Week 10: Pat wrestles with unlabeled ports, yearns for Win 2k compatibility and wonders about switching

I THOUGHT MY FIRST DAY back in the office after my flight from Orlando would be uneventful. I was dead wrong. I hadn't even walked into the building when I received a page that I had to call our server administrator right away. When I got to my office, I was informed that the call center couldn't reach our Windows NT domain.

The call center has its own domain in case something like this happens, so I didn't see the need to rush to fix it.

The answer was simple: The routing table had become unstable and needed to be flushed, eliminating the old rules about which traffic would be routed where so that the router could construct a new and valid table. The rest of the week was quite boring to say the least — lots of e-mails to catch up on and phone messages to return.

Security Manager's Journal

Comfortable in My Skin

I must say, I'm finally beginning to feel truly capable and ready to tackle my new position. After the SANS conference, I feel renewed with a sense of purpose about where to start and a clear understanding of how to achieve my goals.

During the past couple of weeks, I have been somewhat scattershot in how I have been tackling my projects. And I haven't really used Microsoft Project 2000 as much as I've wanted to. I was instructed by my boss to try to use it every day for about an hour and organize what I had achieved that day and what I was going to work on tomorrow.

I began by prioritizing what truly needed to be finished first and why. A secondary firewall for a subsidiary that wants to get a T1 line is definitely a high priority. It has its firewall but not the T1, which left a back door open on our internal network.

My boss had mentioned before I left for the conference that anyone can spend money and achieve his goals, but great people do it on a tight budget.

Along those lines, he asked why we couldn't just buy a four-port Ethernet card (about $500) and put it in our current firewall so we didn't have to buy the Nokia Corp. IP 440 Ipsilon appliance (about $13,000). I told him that the Nokia device would provide a more secure firewall and that we could add three more four-port Ethernet cards as our needs grew. He said that since we use NT and have all the patches and service packs applied, we should be as safe as the version of FreeBSD used in the Nokia. Dammit — I really wanted that firewall box.

I had already ordered two four-port network interface cards (NIC) from our buyer. One was a D-Link Systems Inc. card that cost about $120, and the other was an Adaptec Inc. card that cost $550. I made sure I could return both if the testing didn't work out. Still, I was amused at the difference in cost. Everyone knows the quality of Adaptec's drivers and products. But, although I don't know D-Link too well, I was willing to give the company a shot.

The cards arrived last week while I was in Orlando. I was a bit upset with the Adaptec only because the physical labeling on the LEDs and the cable adapters wasn't what it should have been. I ended up reinstalling NT Server and FW-1 on my lab box because I had the cables out of order. I didn't notice this until I read the instructions and looked at the picture in the back of the manual, not the front.

Well, that was six hours of boredom. So far, the Adaptec is performing great, and other than the confusion over which port is which, the installation was painless and easy.

Next week, I will have a hub connected to a machine to see if I can test the routes between two of the ports while routing between the DMZ and the Internet. I haven't installed the D-Link yet, but each port has its own set of LEDs, and they're numbered 1 to 4, left to right, unlike the Adaptec.

The next project that carries a high priority is the intrusion-detection system that we will implement in our network. I got the funds approved the day before I left for Orlando, and I think I'll go with CyberCop from Network Associates Inc. I was in the lab again, spending half my time on the firewall project and the other half learning how to install CyberCop and becoming familiar with the interface. The bad news is that I learned that the monitor that checks for attacks in real time isn't Windows 2000-compatible.

Up on the Soapbox

With Windows 2000, a lot of software vendors aren't stepping up to bat with timely releases of Windows 2000-compatible software or upgrades. In fact, many are six to eight months away from such releases. Microsoft caused this problem by changing a lot of the Windows 98 code between the last beta release and the release to manufacturing. This caused all the software vendors to rewrite their code twice. Who loses in the end? We, the customers.

Quite frankly, it ticks me off. I can't use Check Point Software Technologies Ltd.'s SecuRemote VPN; Intel Corp. doesn't have software ready for Shiva products; and Internet Security Systems Inc. has some functionality, but that's only because Microsoft invited the company to have some product integration with Windows 2000.

The CyberCop Suite was very easy to install and configure. I didn't even read the instructions. I don't want to be too detailed now, but I'll have a full report when I get the product in.

Switching and Security

Until next week, my friends. I'll be taking an opinion poll about the direction in which you think intrusion detection is moving in regard to a switched environment.

Companies need high-speed, 100M bit/sec. or Gigabit Ethernet switched networks. But in a switched environment, where packets are sent directly to the recipient without going through a hub, intrusion detection suddenly gets much harder. Some vendors say, "Hey, just mirror the ports." But what do you tell your boss when you just spent $250,000 on a nice Layer 2 or 3 switch and a couple of stackable switches, and performance drops back down to 10M bit/sec. because you're mirroring all the traffic to a single port for intrusion detection? ■

THIS WEEK'S GLOSSARY

DMZ: Stands for demilitarized zone, which is a subnetwork separated from a business's core network so that any security failures will affect only the DMZ.

Flushing the router table: Deleting existing rules for routing traffic within a network so an updated or uncorrupted table of rules can be built.

FreeBSD: An open-source Unix operating system for "PC-compatible" computers, developed and maintained by a large team of individuals.

Layer 2 switch: Device that cross-connects stations or LAN segments.

Layer 3 switch: Device that integrates routing and switching of network traffic while forwarding traffic almost as quickly as a Layer 2 switch.

Monitor: Software that allows a network, systems or security administrator to view the status of a network.

Release to manufacturing: The version of software that is deemed stable and debugged enough to be manufactured, packaged and sold.

LINKS:

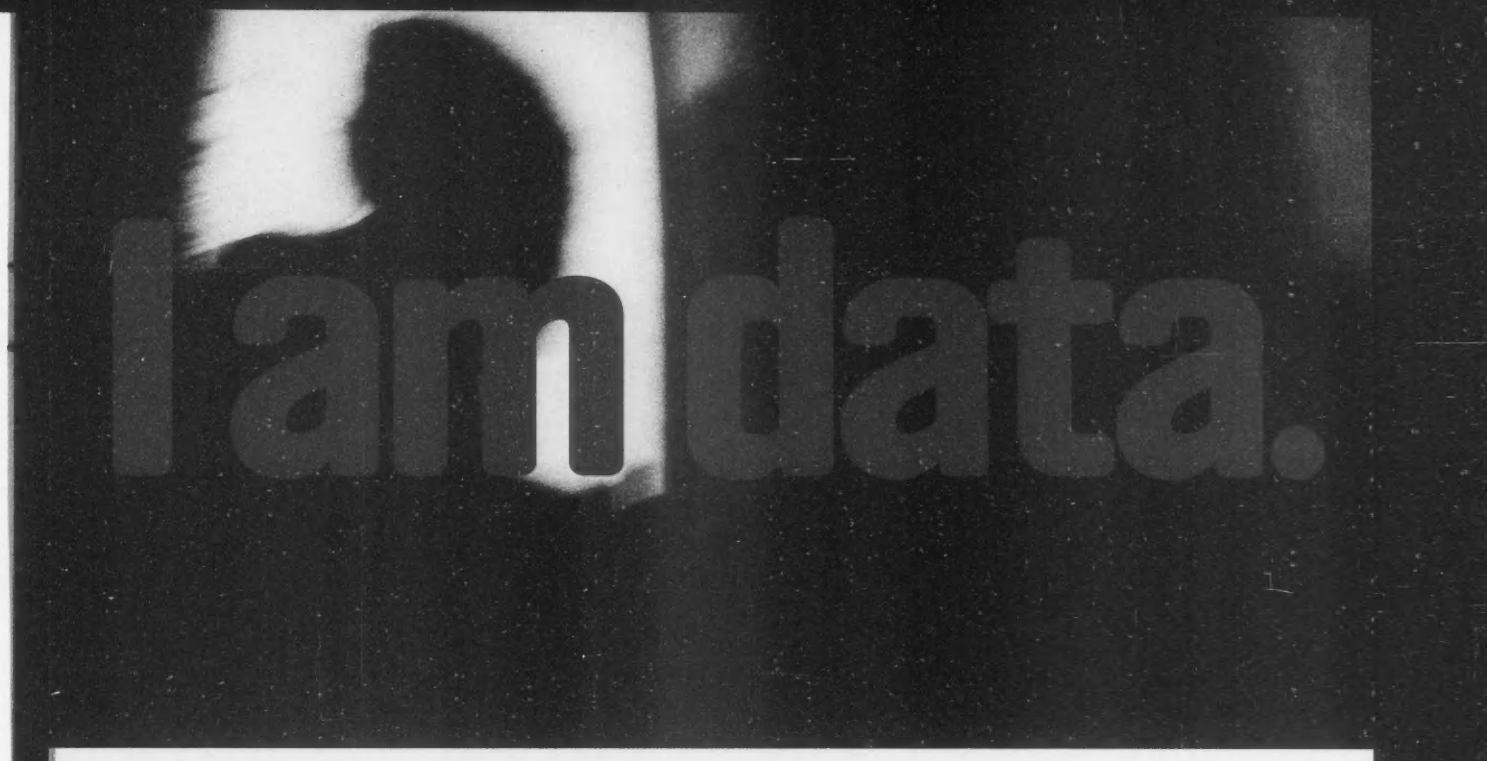
www.adaptec.com: Information about storage and networking products from Adaptec.

www.dlink.com: Information about networking products, including adapters, hubs, switches, transceivers and repeaters, from D-Link Systems.

www.everythingT1.com: The Everything T1 site features links to books, frequently asked questions, news, a list of consultants and a glossary. It also offers a list of T-1 Internet service providers.

www.pgp.com/asp_set/products/tns/cybercop_intrusion.asp: PGP Technologies' CyberCop page includes CyberCop Scanner and CyberCop Monitor information, including product overviews and system requirements.

■ *This journal is written by a real security engineer, whose name and employer have been disguised for obvious reasons. It's posted weekly at* www.computerworld.com *and at* www.sans.org *to help you and our security manager — let's call him Pat — better solve security problems. Contact Pat with comments or advice at pat_rabbinski@hushmail.com, using "Pat's Journal" in the subject line.*



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Structured Query Language

DEFINITION

Structured Query Language (SQL) is a programming language designed to get information out of and put it into a relational database. Queries are constructed from a command language that lets you select, insert, update and locate data. SQL is both an American National Standards Institute and International Standards Organization standard, although many databases support SQL with proprietary extensions.

BY CHRISTINE McGEEVER

THE PRIMARY vehicle used for querying, reading and updating relational databases is a language called Structured Query Language, or SQL (generally pronounced *sequel*). Designed for asking questions about information in a database, SQL isn't a procedural language like traditional choices such as Fortran, Basic, C or Cobol, in which you write a procedure that performs one operation after another in a predefined sequence until the task is done. The procedure may be linear, loop back on itself or jump to another point or procedure. In any case, the programmer specifies the order of execution.

With SQL, however, you tell the system only what you want. It's up to the database management system to analyze the query against its own structures and figure out what operations it needs to perform to retrieve the information.

SQL is so pervasive and fundamental to accomplishing any work involving a database that virtually every application or development tool today, no matter what its own interface looks like, ends up translating queries and other commands into SQL.

Thus, a visual programming tool for developing database-enabled applications may have an appealing, object-oriented graphical interface. But once the programming is done, the system will convert all the underlying database calls and commands into SQL. This simplifies the integration of front-end and back-end systems, especially in multi-tiered client/server applications. The only major exception to this rule is with object-oriented databases, whose structure and architecture may not be relational.

Relational Databases

In a relational database, data is separated into sets that are stored in one or more tables with the familiar row-and-column structure. Relational databases can quickly retrieve separate data items from different tables and return them to the user, or to an application, as a single unified collection of data called the result. Because the various items can be grouped according to specific relationships (such as the relationship of an employee's name to an employee's location or sales performance), the relational database model gives the database designer a great deal of flexibility in describing the relationships between data elements for any specific system. One further result is that the user may gain a greater understanding of the information in the database.

The SQL Story

The history of SQL begins in the 1970s at IBM Research Laboratory in San Jose, where E. F. Codd and others developed the relational database model that spawned the system known as DB2. As relational databases proliferated in the 1980s, SQL was codified for commercial information technology use. In 1986, the American National Standards Institute and International Standards Organization established the language's first standard.

During this time of rapid change and advancement, client/server networks appeared, running a new breed of application that required a new set of programming skills. Using SQL and a network connection, multiple client applications could access a central database residing on a remote server.

In the mid-1980s, Oracle Corp. and Sybase Corp. released the first DOS-based commercial relational database management systems that used SQL as their query mechanism. Microsoft Corp. quickly licensed Sybase's technology as the foundation for its Microsoft SQL Server. Most of these products have also included proprietary libraries of tools that developers can use to make client applications work with the database, as well as drivers for supporting a host of local area network hardware, providing both flexibility and scalability.

Revisions in 1989 and 1992 added fundamental data integrity control, data administration, and definition and manipulation features. Around this time, a companion specification, Open Database Connectivity (ODBC), provided a common application programming interface through which software could connect to another database system, provided it was ODBC-compliant. A few years later, a similar specification called Java Database Connectivity [QuickStudy, Dec. 13] emerged to define how SQL statements can be mapped to Java programs.

The 1992 SQL specification is the most current version, although a new update, SQL3 (also known as SQL-99) has been in the works for some years. The SQL3 standards effort would significantly enhance the language, enabling it to be used with persistent, complex objects in object databases. This means that SQL3 must include generalization and specialization hierarchies, multiple inheritance, user-defined data types, triggers and assertions, support for knowledge-based systems, recursive query expressions and more.

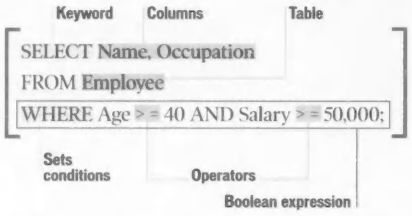
In addition, it must be able to handle all the capabilities associated with object-oriented programming, including abstract data types, methods, inheritance, polymorphism and encapsulation.

A SQL Example

►Let's consider a very simple database consisting of just one table, named Employee:

NAME	AGE	OCCUPATION	SALARY
Andy Apple	28	programmer	$40,000
Brenda Bennett	40	manager	$50,000
Cary Charles	29	administrator	$35,000
Dave Duncan	50	director	$120,000
Elise Enteman	36	vice president	$60,000
Frank Fontanella	46	manager	$52,000

►Now, let's construct a query to find out the names and titles of employees aged 40 or older who earn at least $50,000. The SQL statement could be something like this:



THE RESULT:

►**"Brenda Bennett, manager; Dave Duncan, director; Frank Fontanella, manager."** As SQL statements go, this one is trivially simple; they can become quite complex and convoluted when multiple tables and relationships are involved and very tangled Boolean expressions must be constructed.

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Ethernet Leaps To Hyperspeed

Ten gigabits – who needs it?

By Gary Anthes

BRENT LOWENSOHN isn't sure exactly how health care giant Kaiser Permanente Health Plan Inc. will use 10 Gigabit Ethernet when it becomes available, but he's enthusiastic about it nonetheless.

Lowensohn, director of advanced technologies at Kaiser Permanente Information Technology in Pasadena, Calif., puts it this way: "The most exciting part of this is the real potential that something we never thought of is going to come into our lives. Whenever an enabling technology like this comes along, you expect a paradigm shift in the user community. You've made something that was irrational or uneconomic to think about quite rational and economically viable."

Two decades ago, Ethernet pumped bits around LANs at a rate of 10 million/sec., which was pretty fast at the time. So-called Fast Ethernet, which runs at 100M bit/sec., emerged in 1995, and in 1998, users got Ethernet at 1G bit/sec. Last year, Gigabit Ethernet started to be used in wiring closets and data centers at large companies.

Now, following the dictum that you can never be too rich or too thin, or have too much bandwidth, Ethernet is on the brink of its third quantum jump, to 10G bit/sec. At that speed, an Ethernet link could transmit the information in two four-drawer filing cabinets filled with pages printed on both sides in just 1 sec.

An Institute of Electrical and Electronics Engineers Inc. (IEEE) task force is now drafting specifications for 10 Gigabit Ethernet. The group is expected to issue its first-draft standard in September, with the final standard planned for early 2002. Vendors say they'll start shipping products based on the draft standard next year.

At 10G bit/sec., Ethernet will be able to take over some of the heavy-duty networking applications now dominated by technologies such as Asynchronous Transfer Mode and Synchronous Optical Network (Sonet).

Indeed, the IEEE and a new industry group called the 10 Gigabit Ethernet Alliance are drafting specifications so that companies will be able to seamlessly integrate their LANs with the metropolitan-area networks and the WANs of network service providers. That kind of network integration will lower communications costs and simplify network administration.

Du Pont Co. in Wilmington, Del., offers a costly videoconferencing technology to a few geographically dispersed senior employees. But David Pensak, principal consultant for advanced computing technology at the company, says teleconferencing could be widely deployed at a relatively low cost by upgrading the corporate backbone to 10 Gigabit Ethernet.

Real-time Savings

Pensak says the new technology could also help control "distant instrumentation." Du Pont scientists currently must travel to Chicago to observe experiments on an ultrahigh-intensity X-ray laser there. Ten Gigabit Ethernet could pump experimental data — some 300GB per week — in real time and cost-effectively direct it to the company's labs in Wilmington, he says.

Companies building server farms for high-volume applications such as e-commerce will use 10 Gigabit Ethernet to aggregate multiple 1G bit/sec. Ethernet segments to move huge volumes of data to and from the enterprise network core, says Bruce Tolley, a marketing manager at San Jose-based Cisco Systems Inc.

And Tolley says many large organizations such as financial institutions will lease "dark fiber" — idle, in-ground optical fiber — to build their own low-cost, long-distance networks, using 10 Gigabit Ethernet. "It could be between, say, a trading floor in Manhattan and back-end servers in New Jersey," he says. "The network will look like a LAN but often [extend] 40 or 50 kilometers."

Each generation of Ethernet has offered 10 times more bandwidth than the previous one, at three to five times the cost. Ten Gigabit Ethernet will offer a similar cost advantage, predicts Cam Cullen, a business development manager at 3Com Corp. in Boston. And it will be five to 10 times cheaper than Sonet, he says. An OC-48 Sonet port, which runs at 2.4G bit/sec., costs about $30,000, while a 1G bit/sec. Ethernet port costs $1,200, he says.

No one is thinking seriously yet about 100G bit/sec. Ethernet, but there are ways today to scale beyond 10G bit/sec. One, called "link aggregation," combines multiple 1G bit — and, in the future, 10G bit — physical fibers into one large conduit. The second scaling method uses dense wavelength division multiplexing (DWDM) to combine multiple colors of light, each carrying its own information, into one optical fiber. In the laboratory, DWDM has combined 100 colors at 10G bit each to produce a 1 terabit pipe.

"We are a national organization, and we travel a lot more than we wish we did," Lowensohn says. "High bandwidth plus high processing power will facilitate things we couldn't afford before, such as long-distance collaboration and remote sensing for medical diagnosis and care."

LARA JO REGAN

> Whenever an enabling technology like this comes along, you expect a paradigm shift in the user community.
>
> BRENT LOWENSOHN, DIRECTOR OF ADVANCED TECHNOLOGIES, KAISER PERMANENTE INFORMATION TECHNOLOGY

COMING AT YOU

10 Gigabit Ethernet

WHAT: Ethernet is on the brink of its next quantum leap: increasing the speed of data transmission tenfold from the current standard.

WHEN: Best estimates are that a draft standard will be set for 10 Gigabit Ethernet later this year, with a final standard expected by 2002. Vendors will start shipping products based on the draft standard next year.

SO WHAT? The jump to 10 Gigabit Ethernet should have a dramatic impact on heavy-duty networking applications.

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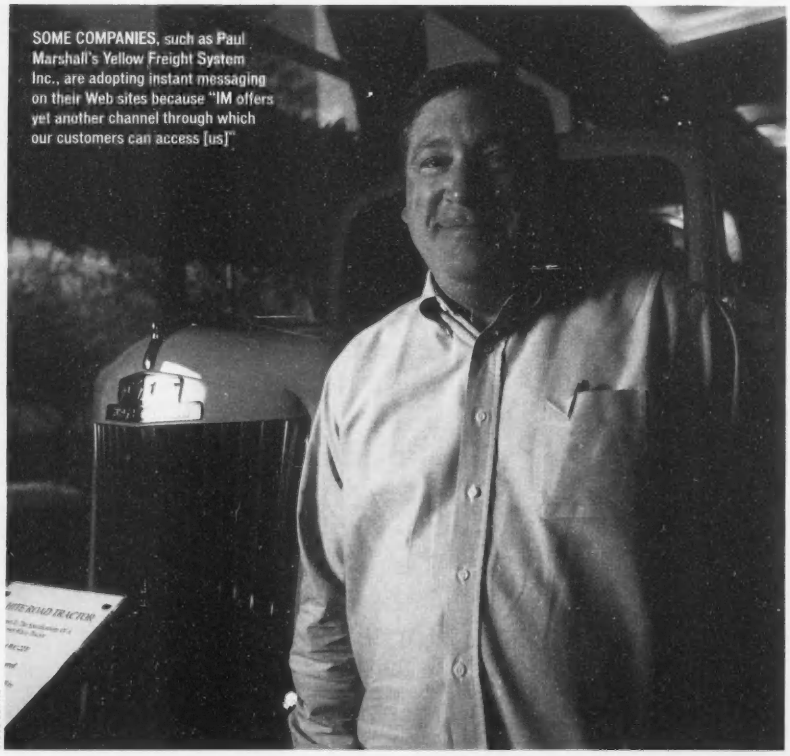


SOME COMPANIES, such as Paul Marshall's Yellow Freight System Inc., are adopting instant messaging on their Web sites because "IM offers yet another channel through which our customers can access [us]"

STEVE CURTIS

THERE'S AN UNFORTUNATE tendency to dismiss instant messaging (IM) as a simple conversational gimmick that's primarily useful for chatting with friends over the Internet. But IM can be a valuable business tool, especially in e-commerce.

In fact, for a Web-based e-commerce environment, IM may be the best and most natural way for a company to provide direct, real-time service to a site visitor who has a question, is lost or has special needs. It adds a flexible, comforting human touch to an otherwise automated process.

IGo Corp. in Reno, Nev., relies on IM to help its customers buy wireless phone and mobile computing accessories such as batteries, adapters and rechargers. IGo President and CEO Ken Hawk says that typical Web site shoppers may very often be in hotel rooms with a single phone line or may have left their cell phones or computer manuals behind and need expert help to determine exactly which battery or recharger they need. IM helps accomplish that.

Customers can click on a Live Help button on iGo's Web page, which brings up a JavaScript applet that allows the user to type in his question to initiate the IM session. IGo's customer service representatives use the system to type responses and even to send customers the Web pages that show the specific devices they need, via a rudimentary push technology. Help arrives "in band," meaning customers don't have to disconnect from the Internet to make a separate phone call.

Wilmington, Del.-based WingspanBank.com, a division of First Bank USA NA, was founded last year to offer banking and investment services over the Web. Terrence Ransford, president and chief operating officer at Wingspan Investment Services Inc., says all but two pages of his firm's Web site offer IM links to investment specialists via Foster City, Calif.-based FaceTime Communications Inc.'s Instant Customer product.

Shifting Focus to the Customer

Ransford's research shows that 70% of Wingspan's customers don't have a second phone line within arm's reach of a home computer. He says he feels that IM makes it easier for customers to use the Web site to complete their transactions and that the result is much greater customer satisfaction. Like iGo, Wingspan Investment Services uses IM to not only send replies but also to push Web pages and addresses to its customers. Ransford has high praise for IM. "It's helped us migrate from a self-service Web site model to a people-oriented department store model," he says.

Wingspan's customer service staff also has a library of cataloged, templated answers to frequently asked questions that they can drag and drop into an IM window to answer a customer's query.

For security, Wingspan uses Secure Sockets Layer encryption to conceal IM data from prying network eyes. In contrast, most IM data flows unencrypted across the Internet in clear text form. Wingspan's IM software doesn't require a Java applet at each client, unlike some other implementations of IM. Rather, it's based on dynamic HTML. A user can click on a photo of an investment specialist to bring up a secure Common Gateway Interface-scripted window to begin the IM session.

Ransford notes that his company's IM system interoperates with Dulles, Va.-based America Online Inc.'s AOL Instant Messenger (AIM) service, and it can use buddy lists from either AOL or Yahoo Inc. One major difference, he notes, is that AOL's and Yahoo's IM services don't offer any security.

There are many competing IM products and services, some aimed at the general public and others at business users. What characterizes the entire field, however, is an overall lack of interoperability. Microsoft Corp., AOL, Yahoo and other vendors have sparred with one another for almost a year over how IM should work — although, in fact, they've mainly been trying to keep their own cus-

Is Anybody There?

One hidden advantage of an IM system lies in the buddy list. More than just a list of people you might want to chat with, it also shows you who's online at the moment (well, whose computer is online, anyway). There are situations in which that information can be really important. Say you need to get information from someone on your project team, but it's 2 a.m. and you don't want to wake anyone. With IM, you can see who's likely to be up and send that person a message. *–Russell Kay*

saging:

for

mmerce?

Instant messaging offers fast, convenient communication and expands the possibilities for customer service. Now, if only everyone could agree on a standard.

By Barry Nance

tomers off their competitors' servers.

To use Microsoft's service, for example, you must have a free Hotmail e-mail account and use the MSN Messenger client application. AOL requires that you sign up for IM service but not for an AOL account. Both Microsoft's and AOL's systems let you maintain a list of people to chat with, but each service works only through its own servers and lets you access only other people who also subscribe to that particular service.

Yahoo has developed its own IM mechanism, Yahoo Messenger. Brian Park, a senior producer with the communications group at Santa Clara, Calif.-based Yahoo, says that although Yahoo Messenger is currently proprietary, the company is looking at the interoperability problem.

FaceTime has an agreement with AOL, so its IM products are fully compatible with AIM.

Yusuf Mehdi, director of marketing for Microsoft's consumer and commerce group, said late last year that Microsoft chooses not to provide Microsoft client software updates that will interoperate with AIM because AIM is insecure. Microsoft has been noticeably silent on the subject since that time, even though IM services are an important part of the company's Exchange 2000 Server.

There's no technical reason why one service couldn't access subscribers to another; in fact, Microsoft's initial IM product could indeed access AIM subscribers — until AOL pulled the plug by blocking Microsoft clients. AOL also recently shut out AT&T Corp.'s I M Here Service, which uses a version of PowWow IM software from Denver-based Tribal Voice and is otherwise interoperable with IM services from Microsoft and Yahoo. PowWow also powers AltaVista Co.'s IM services.

AOL, Microsoft, FaceTime and Yahoo have joined the Internet Engineering Task Force (IETF) working group that's trying to iron out the incompatibilities with the Instant Messaging and Presence Protocol. The group recently finished defining design goals and requirements, but in March, it canceled all future meetings until a complete protocol is submitted.

Although draft protocols are being worked on and one has been submitted, Park says he thinks any standard is still years away. The hurdles, he says, extend far beyond network protocol formats to encompass security and legal issues, among others.

Park says he suspects any initial interoperability between IM clients will take the form of extra software that creates bridges between the different IM network data protocols. He says he sees the IETF eventually proposing a standard that makes IM just another aspect of a Web browser.

The IM Time Line

From an e-commerce perspective, where do customers stand in the IM battle? The answer depends on how many different e-commerce sites they deal with and which IM approach each site has taken.

FaceTime's CEO, Kelly Trammell, looks at the far horizon when he talks about IM interoperability. "IM will follow the path of the early telephone networks, where there were lots of disparate telephone networks that did not interoperate," he says. "When telephone adoption reached critical mass, people demanded interoperability across networks, and telephony standards. The same will happen with IM. As the number of users reaches critical mass in the next one to two years, an IM standard will evolve and be adopted by the major networks."

With the competition between the various IM services, Yellow Freight System Inc. in Overland Park, Kan., chose FaceTime's software, primarily because it's AOL-compatible and AOL has the lion's share of the IM market. The company encourages customers to become AIM users, to add "YellowLive" to their buddy lists and to contact Yellow Freight via the Web.

Paul Marshall, senior director of customer support at Yellow Freight, says that although the company is essentially business-to-business today, he anticipates it will do some retail business in the future. Either way, he says, he believes IM is useful because Yellow Freight wants to be customer-oriented. "We're not sure right now exactly where IM fits in our freight business, but we're adopting it because IM offers yet another channel through which our customers can access Yellow Freight. That's a good thing," he says.

In the future, look not only for IM standards but also for new types of IM, involving voice and video. Microsoft has already made a provision for this in Exchange 2000 Server. Also, IM will expand beyond PCs. "Five years from now, the interface to most cell phones and wireless [personal digital assistants] will include a buddy list," predicts Jerry Michalski, president of Sociate, an industry analysis and consulting firm in San Francisco. "These buddy lists will transform the way people communicate and help them to avoid the necessity of making real-time two-way phone calls to handle simple communications."

Trammell says he's optimistic about IM's future. "For PCs, the IM client will become part of the browser, just like e-mail and news clients were embedded in early browsers," he says. "E-mail will become the offline channel and secondary to IM, just the same way voice mail and answering machines are secondary to the telephone."

This view is supported by Mobile Insights, a Mountain View, Calif.-based consulting firm for the mobile computing and communications markets. It has predicted that the worldwide market for IM will grow to 175 million users by 2002. As of last summer, according to AOL, AIM and Mirabilis Ltd.'s ICQ (an IM platform acquired by AOL) had a combined base of 63 million users sending more than 750 million messages per day.

Pros and Cons

PROS

- Customers appreciate it.
- Customers can get answers while logged on to your site, without having to make separate phone calls.
- Vendors can add a human touch to automated, impersonal storefronts.

CONS

- The absence of an industry standard means limited interoperability among different vendors' IM software.
- It can be slow.
- It lacks security.
- It may be a crutch for a poorly designed, difficult-to-navigate Web storefront.

Nance, a software developer and consultant for 29 years, is the author of Introduction to Networking, 4th Edition *(Que, 1997) and* Client/Server LAN Programming *(Que, 1994). Contact him at barryn@erols.com.*

FINE-TUNED SECURITY

All-or-nothing security doesn't cut it anymore. Serious e-commerce requires security tuned at the application level.

BY KIM S. NASH

THE SMALLEST e-commerce Web site that offers personalized content and the biggest business-to-business online marketplace have one thing in common: the need to give specific users access to discrete portions of behind-the-scenes data.

For Web sites that do little more than provide information, a firewall — which blocks off a group of servers inside a company — is often enough.

But sites that allow Internet business transactions such as banking, supply-chain or retailing need more. There, individual customers must be authorized to access certain applications and data that reside on specific servers. Those users must also be stopped from seeing other data.

Such application-level security is critical to e-commerce, says Rob Enderle, an analyst at Giga Information Group Inc. in Santa Clara, Calif. "Without that granular access, many things like online banking wouldn't be able to exist," he says.

While the need for such tools is clear, the per-user pricing models can make them expensive, and a lack of direct support for some key back-end systems can mean extra programming.

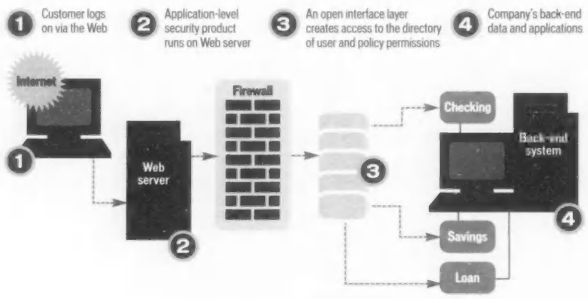
Think of application-level security this way: If a bank's checking, savings, retirement and investment systems were a house, application-level security would be a quick-witted sentry who checks visitor credentials and lets them into only the appropriate rooms.

Among the many vendors that offer such products are BorderWare Technologies Inc. in Mississauga, Ontario; enCommerce Inc. in Santa Clara, Calif.; Gradient Technologies Inc. in Marlboro, Mass.; and Netegrity Inc. in Waltham, Mass.

In addition to fine-tuned user permissions, these products also give online companies the ability to let users access several different applications but to log on to the Web site just once.

Single sign-ons were key to The Prudential Insurance Company of America. The financial company, which has $362 billion in assets, has several business units — insurance, investing and financial planning, among others. But it wanted to present one face to the Web world, says David Kennington, vice president of information systems at Prudential.

Application-level security tools *typically sit on the Web server and use rules (such as which user can access which applications) stored in an interface layer to allow or block access to back-end applications.*



Waiting for Wireless

Newark, N.J.-based Prudential uses enCommerce's getAccess product to help usher authorized users through the Prudential Web site and into copies of mainframe databases.

"Through our single portal, you can see the current value of all your products," Kennington says.

Prudential chose getAccess because it provides the kind of user-access management the company wanted, Kennington says. Also, there were few other products available in 1997, when the financial services firm started to investigate the market, he adds.

Prudential is working on a new feature that will let its customers create a "family view" of all the accounts of spouses and other relatives — providing the user has the right access permissions. For that, the company must build a more granular level of entitlements within applications, Kennington says. He hasn't decided whether to work with enCommerce or another vendor or consulting firm to make this happen, he says.

One thing missing is wireless support, Kennington notes. Prudential wants to let users of handheld computers access their accounts. That would require enCommerce to rewrite sections of its code to handle user authorization data other than the common cookies stored on users' PCs.

Alberto Yepez, chairman and CEO of enCommerce, says support for the Wireless Access Protocol (WAP) is due from the company this quarter.

Downsides

Most application-level security products lack direct integration with popular enterprise resource planning systems from SAP AG, PeopleSoft Inc. in Pleasanton, Calif., and others. Instead, they require information technology staff either to wrap back-end systems in an open framework such as the Common Object Request Broker Architecture from Object Management Group in Framingham, Mass., or to insert an open directory between the company's Web server and legacy systems (see diagram).

However, Netegrity has written custom interfaces for customers using systems that aren't supported by its SiteMinder software, says Bill Munroe, senior product marketing manager at Netegrity.

Out-of-the-box direct connections to PeopleSoft and SAP are due from Netegrity by year's end, Munroe says. So is WAP support.

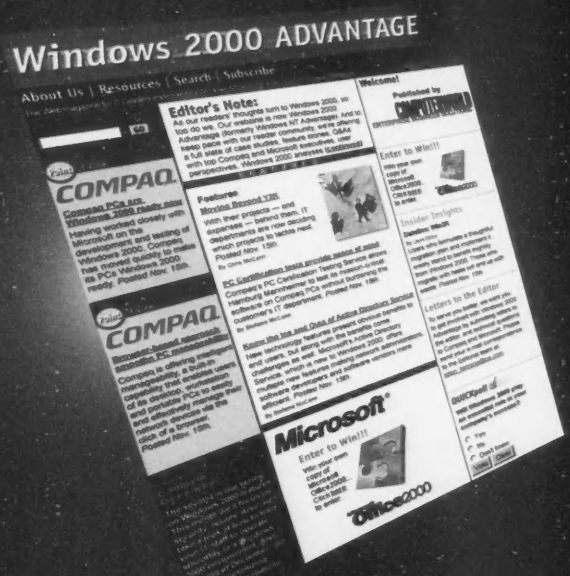
Another downside is that many application-level security products are priced on a per-user basis. That means the customer pays for every person who has a log-on and password for a Web site.

Netegrity, for example, charges between 10 cents and $20 per user, depending on the number of users and type of application. Business-to-business customers are more expensive than business-to-consumer users. EnCommerce also uses per-user pricing.

Gradient bucks the per-user trend, offering its NetCrusader/Web for $28,000 per server.

Despite any drawbacks, Enderle advises IT managers to use prepackaged security products rather than try to build something similar.

"They're the security expert, you're not," he says. "You don't want to expose yourself before you figure out how to resolve all problems."



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Looking for Big Profits In Small Purchases

Start-up iPIN aims to partner with ISPs in the micropayment niche in cyberspace

BY AMY HELEN JOHNSON

THE HUGE upsurge in e-commerce might lead you to believe that online sales sites are an even match for bricks-and-mortar retailers.

But there's one area where cybershopping lags behind — sales of items that cost only a few dollars, the types of things most people pay for with cash in stores. On the Internet, however, dollar bills are out. Credit cards are the dominant method of payment, and their transaction fees of about 4% cut deeply into a merchant's profits on small sales.

San Francisco-based iPIN aims to change that.

The company offers a micropayment plan that relies on existing consumer billing services, such as those from Internet service providers (ISP), wireless service companies and banks, to invoice and collect the fees for small purchases. The company's sweet spot is below the $20 mark, so it has attracted the attention of Web sites offering goods like downloadable music files that sell for 99 cents.

How It Works

Merchants using the iPIN system can choose either a black-box solution that plugs into their existing infrastructure or use the company's software development kit to extend their systems. The connections between iPIN and the clients' accounting systems are made through ISPs. Consumers sign up for a free iPIN account through their provider's automated teller machines and pick a code number to authorize purchases, rather like a personal identification number (PIN). Then, when shopping, they pick the iPIN option from the merchant's list of payment choices. IPIN acts as the clearinghouse, making sure the ISP receives any charges made during the month, which then appear on the consumer's ISP bill as a lump sum. When the bill is paid, iPIN handles the settlement and clearance processes — similar to what Visa and MasterCard vendors do — distributing payments to the merchants involved, with iPIN and the ISP taking a cut off the top.

The Digital Music Co. decided iPIN made sense for its BuyMP3.com music retail site, says Jim Milton, president of the Monmouth Junction, N.J.-based company. The site's core audience is kids between 14 and 17 years old — people not likely to have credit cards, Milton says. Besides, the site is geared toward impulse buying: "You sample 30 seconds of the song and then purchase it," says Milton. So, a payment system that needed minimal input from the buyer was desirable, he says.

BuyMP3's iPIN system went live last winter. It took two engineers about a week to integrate it into the site's shopping card, according to Milton. He says that in the time iPIN has been running on the site, it has matched the 3-year-old CyberGold payment system in terms of number of transactions. Milton says he expects iPIN's percentage of transactions to increase once more ISPs agree to support the system.

ISP Difficulties

The dearth of ISPs willing to pass iPIN charges on to their customers is one thing holding the company back. The huge national ISPs are notably missing from the company's list of partners. However, a developing relationship with Milpitas, Calif.-based GRIC Communications Inc., which is building a billing system that allows a cooperative partnership of global providers to offer their customers Internet services through one another's networks, bodes well for increasing ISP participation.

Despite the need to increase the company's ISP ranks, Kim Underwood, a research specialist at Gartner Group Inc. subsidiary Datapro in Delran, N.J., says iPIN has a viable system. Its primary selling point for merchants is the ability to enter the e-commerce market quickly and avoid spending hundreds of thousands of dollars for a billing infrastructure. Also, the company has operations in Europe and will do the necessary currency conversions to make international sales possible.

But Underwood says the newness of the market leaves many questions. Will the registration process be a stumbling block for customers? How will iPIN handle the fraud issue? ISP customers can't be rated like credit-card applicants, and Internet fraud will likely accelerate as e-commerce grows, she says. The company also needs to figure out how to handle nonpayment and disputes between merchants and shopper, adds Underwood.

Johnson is a Computerworld contributor in Seattle.

JOHN HARDING

IPIN FOUNDER AND CHIEF ADVISER Jim Justice with CEO Bradley Rode

iPIN

Location: 577 Second Street, Suite 200, San Francisco, Calif. 94611

Telephone: (415) 547-2700

Web: *www.ipin.com*

The technology: Internet micropayments

Why it's worth watching: Appends charges to existing customer bills, like ISP fees and wireless phone bills

Company officers:
- Jim Justice, founder and chief adviser
- Bradley Rode, CEO
- Alexandre Gonthier, chief technology officer and vice president of product development

Employees: 50; increasing 100% per year

Milestones:
- 1998: Founded
- Fall 1999: Global payment system debuted

Burn money: Accel Partners, Sutter Hill Ventures, Gil Amelio, Geneva Venture Partners

Products: E-Content Payment System

Customers: EMusic.com Inc., ArtistDirect Inc., The Orchard LLC, Mjuice.com, The Digital Music Co.

Partners: FlashNet Communications, GRIC Communications Inc., AT&T Corp.

Red flags for IT:
- Few ISPs and other billing services have signed on. Plus, marketing efforts are split between ISPs and merchants.
- There's a four-year history of consumers snubbing micropayment schemes.
- Is anyone besides music sites interested?

COMPUTERWORLD emerging companies

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Micropayment Field Growing

The micropayment market could be lucrative in the future, attracting companies willing to struggle to produce a viable technology. Datapro's Kimberly Underwood has identified a range of competitors to iPIN:

1ClickCharge

CMGI Inc.
New York
www.1clickcharge.com

Charges end up on a consumer's credit card. The registration process requires downloading a thin client and filling out information on which card to use. When a purchase is made, the downloaded applet requests the goods and authorizes payments. 1ClickCharge is aimed primarily at content providers who charge for information.

CyberGold

CyberGold Inc.
Oakland, Calif.
www.cybergold.com

Consumers fund their CyberGold accounts by responding to advertisements by CyberGold's partners. Shopping at participating merchants also earns a rebate. The credits can be spent on goods, transferred to a bank account or credited to a charge card. CyberGold also lets people donate their credits to charity.

eCash

eCash Technologies Inc.
Bothell, Wash.
www.ecash.net

ECash software relies on digital signatures and public key encryption for authentication and security. Launched worldwide in February, eCash boasts a partnership with Deutsche 24, a bank in Germany. Unlike iPIN, banks handle the settlement process.

eChargePhone

eCharge Corp.
Seattle
www.echarge.com

Lets consumers add charges to their phone bills, similar to the 900-number model. Used primarily for subscription services. Requires customers to download software to receive encrypted data and initiate charges. It's limited to systems that can make phone calls to the eCharge server. An eChargeNet product for Internet shopping is in the works. – *Amy Helen Johnson*

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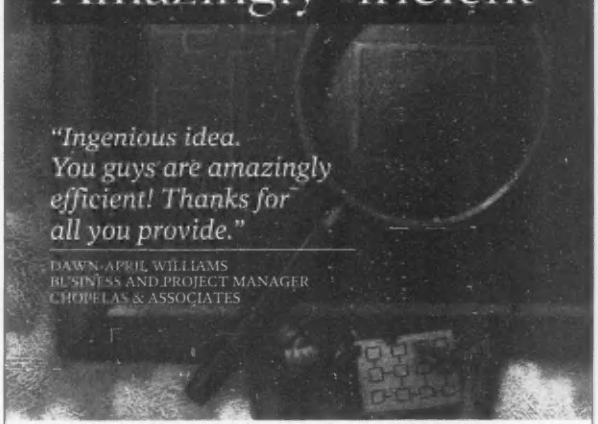

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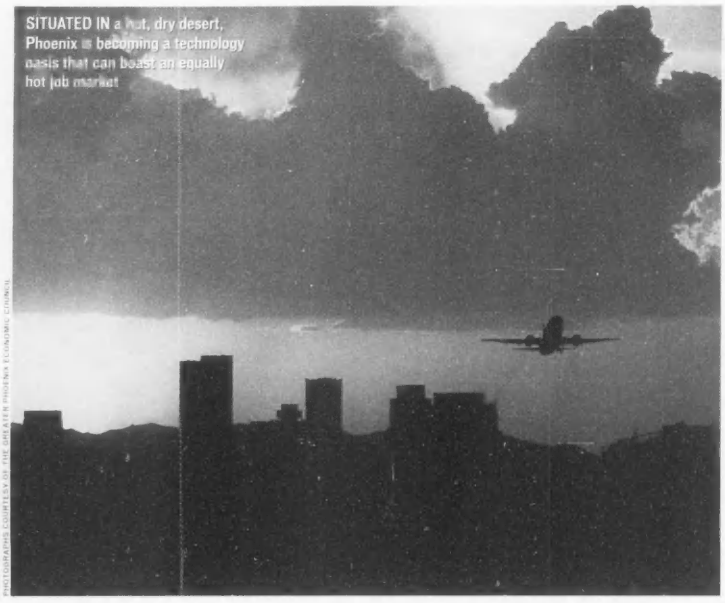

SITUATED IN a hot, dry desert, Phoenix is becoming a technology oasis that can boast an equally hot job market

PHOTOGRAPHS COURTESY OF THE GREATER PHOENIX ECONOMIC COUNCIL

Phoenix Rising

Not all dry land and desert, this Arizona town is a hotbed of economic activity, with an increasing population and low unemployment. And more and more, IT experts are noticing. By Erik Sherman

IF YOU THINK of Phoenix as an arid desert town with little to offer, start reconsidering. Although it's hot as blazes there, so is the job market, with 60,000 new residents per year and a steady unemployment rate of 2.9%, according to a market report commissioned by the Greater Phoenix Economic Council.

Increasing industrial and high-tech activity has been acting as a magnet, drawing even more companies and employees to the region. With plenty of work and a low cost of living, Phoenix has become more attractive to information technology experts.

Industry in the Region

Technology, in one form or another, has been a part of Phoenix's business landscape for many years. Starting with New York-based American Express Co., which established its worldwide processing center in the area, and reaching a peak in the 1990s, Phoenix has become one of the capitals of the back office. Forest City, Calif.-based Visa International Inc. also does its processing in Phoenix.

Weather is a big reason: The area doesn't experience tornadoes, snow or other climatic shakedowns that can cut power and render a processing center useless.

"It's not known as a headquarters office location," says Tom Graunke, CEO of KnowledgeNet Inc., a Web-based IT training firm. "But the size of businesses that are here is impressive. What that has done is create a talent pool." Graunke says he's had no problems filling IT and technical positions, but his company of 285 employees has seven people recruiting candidates. It typically takes two months to fill a job opening, he adds.

Although corporate headquarters may not be a mainstay, Avnet Inc., MicroAge Inc., Phelps Dodge Corp. and Allied Waste Industries Inc. — all Fortune 500 companies — have their main corporate offices in the greater Phoenix area. Other companies with a major presence include Intel Corp., Honeywell Inc., Motorola Inc., The Dial Corp., Citibank, AlliedSignal Inc. and US West Inc. The dot-com presence, although growing, isn't yet a major factor in the economy.

The Hiring Picture

Finding IT professionals is never easy. Even the companies that claim they have an easier time of it than others often bring some percentage of workers in from out of state.

"Hiring capable software talent or any other technology expertise today is difficult, no matter where you go," notes George Wallner, CEO of Hypercom Corp., a $350 million provider of electronic payment systems and telecommunications equipment.

Wallner has to look both locally and out of state for employees, with software engineers experienced in C++, Visual Basic and HTML key targets. Particularly difficult to find are project managers who can handle an entire project, from learning the business requirements to its completion.

Money Matters

If there's any bad news, it's that compensation is probably a little lower than national averages. "We're relatively comparable [to other areas]; perhaps a little bit less," says Rob Owen, vice president of IT and the information systems group at Microchip Technology Inc. in Chandler, Ariz.

Owen says salary ranges are broader now than they have been in the past and that both employers and employees should plan to be flexible. He says that ideally, he would like candidates to be "highly skilled in IT, then with a strong background in semiconductor manufacturing." But he concedes that such candidates are scarce.

The good news is that expenses are low, so employees may keep more of what they earn. Housing is relatively inexpensive, with a median home sale price of $126,500 last year; the U.S. average was $133,300 during the same period, according to the National Association of Realtors in Washington. Property taxes on a typical home could run from about $1,580 to $2,530 per year. Last year's personal income tax rate was a graduated amount that topped out at 4.72% unless an employee earned more than $150,000 annually.

Housing is plentiful, so employees can live near their workplaces. That's good, because the greater Phoenix area is comparable in area to Rhode Island, and driving from northern locales to the south can take 60 to 90 minutes.

Phoenix itself may be in the middle of scrub desert, but mountains with standing lakes and trees are within a two-hour drive. The weather ranges from shirtsleeve temperatures in the winter to summer averages well above 100 degrees.

Public schools are ranked above the national average, with a pupil-to-teacher ratio of 18.6 to 1. ◗

Sherman is a freelance writer in Marshfield, Mass.

AT A GLANCE

Phoenix Facts

Top IT skills sought:
- C++
- HTML
- Visual Basic
- Networking
- Industry-specific business knowledge

Top IT jobs in demand:
- Project managers
- Software engineers
- Business analysts
- Networking engineers
- Web developers

Major Phoenix employers:
- AG Communication Systems Inc.
- AlliedSignal Aerospace Inc.
- America West Airlines
- Arizona Public Service Co.
- Arizona Water Resources Department
- Banc One Arizona Corp.
- Choice Hotels International Inc.
- The Circle K Corp.
- City of Phoenix
- Mattel Toys Inc.
- Phelps Dodge Corp.
- Salt River Project

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The San Francisco office of Charles Schwab & Co., Inc. has Staff, Sr. Staff and Director career opportunities in the Schwab Information Technology Enterprise. Specific disciplines include Database Administration, Systems Programmers, Programmer Analysts, Information Security Specialists, System Administrators, Architects, Project Managers, Systems Engineers and Network Engineers. Technical Environments: NT, UNIX (Solaris, AIX, HP-UX), MVS, CICS, CICS/6000, SNA, C, C++, COBOL, Powerbuilder, SQL DB2, Oracle, PeopleSoft, Firewalls, Visual Basic, Java, JavaBeans, ActiveX, J++, CGI Scripting, HTML, SILK, QA Partner, CORBA, DCE, HP-Openview, NewBridge, Tivoli, Remedy, Legato, Periphonics, CTI, Parallel Sysplex, LDRPS, MQ, NetIQ, ATM, PBX, Electronic Output, Cisco, Sendmail, Imaging, Electronic Messaging, AFP. We offer the competitive salaries, excellent incentives and the comprehensive benefits of a recognized industry leader. Email your resume, indicating Job Code SK/99IC to: schwab.jobs@schwab.com. Charles Schwab & Co, Inc. Member SIPC/NYSE. 0300-5070. Equal Opportunity Employer.

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www.apar.com E-mail: recruiter_usa@apar.com

SR. SOFTWARE ENGINEER (Marlborough, MA).Design, develop, implement & maintain code for enterprise mgmt software products utilizing C++/MFC, OLE & ODBC under Windows NT platforms. Develop concepts & techniques for coding & designing system software. Conduct code & design walkthroughs, review the work of other programmers & monitor system test projects. Use debuggers & knowledge of Windows NT, ODBC & programming in C++ to diagnose & fix product defects & document & explain usability issues to clients. Req's: MS in Comp Sci, Math or Eng. & 1 yr exp in job offered or 1 yr exp as Software Eng. or Programmer. The 1 yr exp must include working with C++/MFC, OLE, ODBC & Windows NT. 40 hrs/wk; M-F, 9:00-5:00; $72,500/yr. Send resume to Case #: 19991477. PO Box 8968, Boston, MA 02114.

Project Leader. Lead & manage projects to design, develop, implement, test & maintain mainframe systems applications for business clients. Perform project planning, scheduling & budgeting. Act as liaison between clients & technical staff. Prepare progress reports. Tools: CICS; DB2; MVS; JCL; COBOL; SAS; MANTIS; UNITECH; TOTAL; Visasoft; Endevor. Master's* degree in Computer Science* + 1 yr exp. in job offered or as a Systems Analyst required. Prior exp. must include: SAS; CICS; DB2 (*Will accept a Bachelor's degree in any engineering field + 5 years progressively responsible exp in systems development). 40 hrs/wk. 9am-5pm. $72,000/yr. Must have proof of legal authority to work in the US. Send resumes to Nebraska Job Service, 550 South 16th Street, P.O. Box 94600, Lincoln, NE 68509. Ref#: NE 0268800. An employer paid ad.

Software Engineer will be designing applications using COBOL, DB2 and CICS. Will lead a team of software engineers and develop tools using C, C++. Design, analysis, construction, testing and installation of the complete system. Responsible for user interaction, design of repository, development of CICS screen and maintenance of the system. Will be using ADW, INTERTEST, SPUFI. Should be willing to travel on a project by project basis. 40 hour week, 9AM-5PM, $65,000 per year. Master's/Foreign degree equivalent in Engineering, 1 year exp. in job offered or 1 yr. exp. as a team lead. Submit resume to: Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302. Re: JOFL#2072923.

Programmer Analyst. Design, develop, implement and analyze client/server applications. Design, develop and implement financial systems. Write interfacing programs. Demonstrated ability designing, developing and implementing systems using Sybase and PowerBuilder. Demonstrated ability working with C language and Unix to write interfacing programs. Demonstrated ability working with Unix and TCP/IP protocols. $56,000/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 1 yr. exp. (or 1 yr. exp. in related occupation of Software Engineer) and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #19992388, P.O. Box 8968, Boston, MA 02114.

Programmer/Analyst -(over 50% of time in Englewood, CO; bal. elsewhere) Analyze needs; design, develop, test software on Windows NT; design graphical user interface using Visual Basic; develop SQL Server & Sybase databases. Bachs/Comp. Sci or Engg or Math. 18mos/exp. in job offered. 40hrs/wk. (M-F; 9-6) $63,000/yr. Must have proof of legal authority to work in the U.S. Mail resumes to: Colorado Department of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe St., Denver, CO 80202-2117. Refer to Order # CO4657154. Application is by resume only.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain application software in a client/server environment using C, C++, SQL, PL/SQL, Oracle, Forms, Reports, Pascal, Shell Programming and HTML under Windows 98/NT, UNIX, Sun Solaris and MS DOS operating systems; Design cross-bus architecture bridging operating systems for interprocessing communications. Require: B.S. in Computer Science/Engineering, or a closely related field, with two years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Salary: $66,000 per year, 8 am to 5 pm, M-F. Send resume to: Raghavendra Kulkarni, President, Pro Softnet Corporation, 6525 The Corners Parkway, Norcross, GA 30092; Attn: Job SY.

Data Base Analyst. Database design and development and network integration for WAN/LAN. System integration for network operating system and programming using C, C++. Demonstrated ability in network integration using Novell Netware and Unix. Demonstrated ability in system integration using Windows NT. Demonstrated ability to design and administer Oracle databases. $62,108/yr. 40 hr/wk. 9 a.m. - 5 p.m. Must have 5 yrs. exp. (or 5 yrs. exp. in related occupation of Network Administrator) and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #19991627, P.O. Box 8968, Boston, MA 02114.

Unix System Administrator: Client site in Florida. Perform systems programming, support and troubleshoot Sun Workstations and Servers on Solaris platforms. Install, maintain, support, and program voice/telecommunication packages on IVR platform. Bachelor of Engineering degree in Electronics, Comp Sci., or Comm. Engg plus 2 years exp. in job offered or as software engr. Mon-Fri., 40 hrs./wk., 9 a.m.- 6 p.m., $52,000/yr. Must have proof of legal authority to work in the United States. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302-0869. Refer to Job Order: FL-2077303.

SENIOR SOFTWARE ENGINEER (multiple positions available) to architect, design, develop, test and maintain real-time processing internet-based distributed software systems and client GUI applications using object-oriented methodology. UML, C++, Java, DCOM, CORBA (Orbix), MFC, ATL and Java Swing on IBM AIX and Windows 95/98/2000/NT platforms. Require: B.S. degree in Computer Science/Engineering, or a closely related field, with four years of experience in the job offered or as a Software Engineer. Salary: $66,800 per year, 9:00 am to 6:00 pm, M-F. Send resume to: Tracy Breeden, Human Resources Specialist, Eshare Technologies, Inc., 5051 Peachtree Corners Circle, Norcross, GA 30092; Attn: job PL.

Software Engineer
(several positions)
Phila/vicinity client sites.
Design & develop software applic'ns for fin'l institutions using COBOL II, DB2/SQL, CICS, & VSAM under MVS op. syst. BS-CompSci, Eng'g or Math + 3 yrs exp in job offered or 3 yrs as Programmer/Analyst or related EDP occupation. Must have exp w/: DB2/SQL, CICS, COBOL II, VSAM (MVS/JCL/util). 35 hrs/wk; $58,550/yr. Submit resume or C.V. to:
The Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila, PA 19123.
Ref: J.O. # 6831061.

SOFTWARE ENGINEER: Jacksonville, FL full-time opening to design & develop systems using DMs/AIM, AIM FTR, AIM Redline, Visual C++, Visual Basic, Express TK, Express RT, C, C++, IML, Microsoft Developer Studio. Req. M.S. in Computer Science plus 1 yr. exp in the job offered. Resume to: Manager, SoftTech, Inc., 8282 Western Way Cir., Ste. 1110, Jacksonville, FL 32256.

Programmer Analyst. Analyze, design, develop, test, implement and maintain client server Oracle Financials and Applications. One year experience working with Oracle Financial applications such as GL, AP, AR. Demonstrated ability working with C++, PL/SQL, Developer 2000. Demonstrated ability working on multiple platforms such as Unix, Novell Netware, Windows NT. $41,000/yr. 40 hrs/wk. 9 a.m. - 5 p.m. Must have 2 yrs. exp. and B.S. Comp. Sci., Eng. rel field/equiv. Send 2 copies of resume: Job Order #2000-189, P.O. Box 989, Concord, NH 03302-0989.

Programmer/Analyst: St. Louis, MO area client site. Analyze, design, code, test (unit, functional and interface testing) and documenting server and batch software applications utilizing C, COBOL and Tandem servers. Bachelor's degree in Computer Sci., Engineering or Mathematics and 2 yrs. exp in the job offered. $56,000 per year, 40 hours per week. Submit resume to Mrs. J. Gaston, Division of Workforce Development, 4040 Seven Hills Drive, Suite 166, Florissant, MO 63033, Job Order # 222087.

Programmer/Analyst
(several positions)
Phila/vicinity client sites.
Analyze, design, code, test & maintain on-line & batch business applic'ns in IBM m/f environment, w/focus on modification & enhancement functions. Req: BS in field of CompSci, Eng'g or Math. + 2 yrs exp in job offered or 2 yrs related EDP exp. Must have exp w/: COBOL/II, MVS/JCL/util, CICS, VSAM, DB2 or ADABAS/Natural. 35 hrs/wk; $53,880/yr. Submit resume or C.V. to:
The Phila. Job Bank, 444 N. 3rd St., 3rd Fl., Phila, PA 19123.
Ref: JO# 2031276.

Programmer/Analyst (Job in Little Rock, AR; Tallahassee, FL; & other client sites in U.S.). Analyze, design, develop, test, & implement clients application system & subsystems; prepare program specifications & job flow diagrams; provide technical support. Environment: IBM Mainframe; COBOL II; CICS; DB2; VSAM; TSO/ISPF. Bachelor's degree any major + 2 yrs exp in job off'd. 40 hrs/wk; 8am-4:30pm; $64K/yr. Send resume to #JOFL 2074317; Dept. of Labor/Bureau of Workforce Programs Support; PO Box 10869, Tallahassee FL 32302.

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EOE

Senior Systems Analyst needed for Information Technology and Development Consulting Firm in the Cedar Rapids, IA area. Job duties include: Analyze, design, develop, and test telecom billing and network systems, and large business applications. Uses: COBOL II, IDMS, CICS, MIDDLEWARE, XPEDITOR, UNIX and ORACLE. Applicant must have a Bachelor of Science in Computer Science, Mathematics, or Engineering. Applicant must have 5 years experience in the job duties listed above, 40 hours a week, Mon-Fri, 8:00a.m. – 5:00p.m., $63,000/yr. Must have proof of legal authority to work in the United States. Send your resume to: the Iowa Workforce Center, 800 Seventh St, Cedar Rapids, Iowa 52406-0729. Please refer to Job Order IA1101043. Employer paid advertisement.

SYSTEMS ANALYST to analyze, design, develop, test, implement, and maintain Enterprise Resource Planning (ERP) applications and systems using SAP, R/3, ABAP/4, Workflow, MAPI, BAPI, Oracle, and Visual Basic under Windows NT operating systems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field, with one year of experience in the job offered or as a Programmer/Analyst; Extensive travel on assignment to various client sites within the U.S. in required. Salary: $68,000 per year, 8 am to 5 pm, M-F. Send resume to: Ramesh Dontha, CEO, Eusophix International Corporation, 9961 Atlantic Blvd., Suite 310, Jacksonville, FL 32225 Attn: Job KP.

Regional Manager Latin America
40 hrs/wk, 8:00 a.m. to 5:00 p.m. Job in Miami, Florida. Salary $60,000/yr. Must have B.S. in Computer Science or equivalent, plus 5 yrs. exp. in job offered or in related occupation of sales and support for UNIX into Latin American market. Must be fluent in Spanish and able to travel to Latin America 40% of time. Responsible for leading a sales team in developing the Latin American marketplace through both indirect and direct channels approach. Provide software and services solutions and technical assistance to business partners and end users, using knowledge of computer engineering and cost effectiveness. Utilize detailed and complex selling process. Direct and instruct sales staff on selling to professional and technical executives. Work with marketing department to devise strategies to meet and exceed quotas. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302, Job Order #FL2072064. EOE.

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(B) Sun Solaris, C, Sybase, APT, HP Unix, Win NT,TOPS20, Java Script, Java, Thoroughbred Basic 8. 4.1, Navigator 2.0, Microman II, AWK Programming and Shell programming.
(C) Visual Basic5.0/6.0, COM/DCOM, Active X,ASP, Turbo-C, Fortran, C SQL Server and Oracle 8.
(D) Java, C++, CORBA, Visibroker, IBM Web sphere, BEA Web logic, EJB, Rouge Wave studio, CGI/PERL, XML, Sun Solaris/ Windows NT/98 and Oracle 8.
(E) PB 7.0 with PFC & Oracle

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Please fax or e-mail resume to HR Dept 770-447-1158 or resumes@celltechsystems.com

Sr. Software Eng., analyze, design & implement distributed database & communications service systems. Required: Master's or foreign deg. equiv. Computer Sc., Eng. or Math with 3 yrs work exp. in computer science, including 2 yrs object-oriented development, database programming & distributed computing (CORBA, RPC & TCP/IP).

Sr. Network Eng. II, design, install, & maintain all network equip. Required: Bachelor's or foreign deg. equiv. in Computer Sc., Computer Eng. or Elec. Eng. with 2 yrs exp. as Network Eng. for ISP including 2 yrs of TCP/IP and communications & routing protocols.

Software Developer. analyze, design & implement web-based applications for large subscriber base of internet service provider. Required: Bachelor's or foreign deg. equiv. in Computer Sc., Elec. Eng. or Math with 2 yrs exp. software development or system/network administration, including 2 years C, PERL, TCP/IP networking, DHCP, JAVA, Active X & UNIX administration.

System Analyst, modify & maintain major internet server programs (HTTP, HTTPS, FTP & SMTP) and systems. Required: Bachelor's or foreign deg. equiv. in Computer Sc., 6 mos. exp. in UNIX administration, system & network security, TCP/IP networking and C and PERL languages.

Respond to: Ms. Laurie Gardner
MindSpring Enterprises, Inc.
1430 W. Peachtree St., N.W. # 400
Atlanta, Georgia 30309

PROGRAMMER ANALYST needed for analysis, design, programming and implementation of mainframe and client/server systems using COBOL and Assembler; to code and implement conversion of data from IMS to DB2 and develop interfaces to Windows NT and Microsoft SQL server. Bachelors degree required in Math, Computers, Engineering or any other related field of study, plus one year of experience in the job duties described above. Must have proof of legal authority to work in the United States.

Salary: $52,000.00/year for a 40 hour work week.

Send your resume to Tom Moloney, Nebraska Workforce Development, P.O. Box 94600, Lincoln, Nebraska 68509. Refer to Job Order NE0266628. This advertisement is paid by the employer.

Senior Software Engineer/ Project Leader: Manage a group of several engineers and work as an individual contributor to solve Year 2000 (Y2k) problem for our clients. The responsibilities include analyzing large code based written in various languages; modifying software tools to aid in the identification of Y2K problems; correcting such problems; and conducting tests to ensure that the systems function properly. Management activities include project assignment, project tracking, technical consulting to the staff, and general responsibility for quality and delivery schedules. Re: M.S. or Equivalency in Computer Science or related field with 2yr. exp. or job offered as Software Engineer/CIM Researcher. Working knowledge of multiple programming languages such as C, COBOL, Visual Basic, Shell/PERL scripts, and PowerBuilder; database systems such as Oracle, SQL Server and Sybase; and operating systems including Unix and NT. 40hrs/wk, 8:00am-5:00pm, $89,668.00yr. JO#19991054. Applicants must send 2 resumes to: Case # 19991054 PO Box #8968, Boston, MA 02114.

Regional Technical Support Associate. Job location: Rosemont, IL. Duties: Coordinate & ensure resolution of highly tech. product or network problems. Suggest alternate solutions to either software or operating system problems in the customer network. Supply tech. & eng. services, incl. maint. and repair, for QMS products. Perform pre-site inspection on more complex system configurations. Conduct training sessions in the function, operation & maint. of QMS laser printers. Provide tech. support on product updates to all field personnel. Develop & maintain a tech library. Requires: B.S. in Comp. or Info. Sci., or related field. Will accept any comb. of educ. & exp. equiv. to a B.S. degree. Salary: $50,000/yr. Send resume to Todd St. Mary, QMS, Inc., One Magnum Pass, Mobile AL 36618.

System Analyst needed for Information Technology and Development Consulting Firm in the Cedar Rapids, IA area. Job duties include: Analyze, design, develop, test and maintain computer systems and applications. Uses: Assembler, REXX, JCL, CICS, COBOL II, SQL, IDMS and PVCS. Applicant must have a Bachelor of Science in Computer Science, Mathematics, or Engineering. Applicant must have 2 years experience in the job duties listed above. 40 hours a week, Mon-Fri, 8:00a.m. – 5:00p.m., $57,000/yr. Must have proof of legal authority to work in the United States. Send your resume to: the Iowa Workforce Center, 800 Seventh St, Cedar Rapids, Iowa 52406-0729. Please refer to Job Order IA1101044. Employer paid advertisement.

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- 2+ years R/3 experience
- Project management experience desired
- Consulting experience desired
- Experience with R/3 implementation methodologies
- Experience with multiple R/3 applications such as FI, MM, SD, PP, HR, etc.
- Combination skills may include ABAP, Java, XML, Internet, and ALE
- Mobile computing and web development skills are desirable

Job Code: G0008/CWD/145

Basis Systems Consultants
- 5+ years broad industry experience
- 2+ years R/3 experience
- 1+ years technical project management experience
- Consulting experience desired
- Experience with R/3 implementation methodologies
- Experience in one of the following: UNIX, DBS, Linex, NT, Oracle, SQL Server

Job Code: G0008/CWD/145

DESIGN CENTRE DEVELOPERS

Our Design Centre is seeking basis tools consultants with the above skills that are capable of leading technical development efforts, providing technical expertise, designing, coding, testing, and debugging projects.

Requirements include senior ABAP development skills, strong familiarity with making enhancements in an R/3 environment, and understanding of how R/3 components integrate with each other. **Job Code: G0008/CWD/146**

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We are seeking Solution Engineers who will identify, define customer needs, objectives and business requirements concerning mySAP.com components and the underlying technology. You will play an active role in the sales process and create value through presentations and positioning of mySAP.com's technological architecture and tools. You will help develop and maintain solution demonstrations and support collateral for all technological aspects of the sales cycle.

Requirements include technology presales experience with E-commerce solutions and/or ERP solutions, in-depth knowledge of E-commerce architecture and tools (Web deployment and development), as well as client/server architecture and systems infrastructure management. Excellent communication and presentation skills a must.
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IT Professionals with 3+ Experience in 'C', VB with SQL SERVER, ORACLE needed. Extensive experience with Btrieve, CTI Integration, Crystal reports essential. Travel Required.

Please send your resume & salary requirements to HR, Computer Software Associates, Inc. 8041, Queensair Drive, Suite 4-112, Gaithersburg, MD 20879.

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SOFTWARE CONSULTING ENGINEER

Perform at corporate office in Atlanta, Georgia and at various client sites in USA, on-site user research, estimate, evaluate and design software systems and applications utilizing object oriented methodologies and CASE Tools, and software through pictures ("STP"); develop applications in C, C++ utilizing Borland's Workshop, and object windows Library ("OWL") for GUI, UNIX Shell Scripts for Batch Processing, CGI, and HTML for Web Interfaces, and Oracle RDBMS. Direct testing, programming and debugging procedures for systems developed. Make recommendations for system upgrades in accordance with end user requirements. Education & Experience: MS degree in Comp. Science./Related Field with 2 yrs. experience in job offered. Salary: $67,000/yr. Benefits: major medical for self, vacation, and sick leave; This is a consulting position and travel at client locations within the US is required. Applicants having proof of legal authority to work in U.S. respond to Georgia Department of Labor, Job Order # GA6509921, 2943 N. Druid Hills Rd., Atlanta, Georgia 30329-3909 or the nearest Department of Labor Field Service Office.

computer/info systems

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Andrew Corporation, a global leader in telecommunication products and services, has an outstanding challenge for a seasoned IT professional:

Database Administrator

Working with the MIS support and Business Systems Development staff, this individual will provide technical database design/development for application and MIS support systems, as well as support the SAP Technical Administration for the main Andrew Corporation business.

Duties will include developing programs, applets, macros and sub-modules as needed to support business systems, designing/providing tools to assist in the management of the database and transaction processing environment, developing a methodology for the ongoing assessment of database performance and identification of problem areas, performing upgrades of new SAP releases as they occur; identifying causes/resolving problems occurring in the SAP software and Oracle database that support SAP, developing/publishing performance reports tracking SAP transactions and response time, maintaining a current knowledge of database and SAP technology, attending seminars/user meetings on both subjects, providing guidance/consultation to end users and MIS developers related to database/SAP technology.

Bachelor's degree in Computer Science Information Systems required, with emphasis on Business Systems or Data communications preferred. Qualifications include 1-5 years of database programming/implementation/development experience with a broad variety of databases, preferably utilizing object oriented development languages. Experience implementing and/or administering ERP systems in a multi-national environment and training with administration of SAP in a UNIX environment needed. Some travel to Andrew locations required. Fluency in Mandarin and Taiwanese languages a plus.

In return for your expertise, we offer an outstanding starting salary with excellent benefits. Candidates must be eligible to work in the U.S. without a corporate sponsorship. For consideration, forward resume with salary consideration to **Attn: HR/JC, Andrew Corporation, 10500 W. 153rd Street, Orland Park, IL 60462. Fax: 708-873-3640. Email: janice.ceresa@andrew.com** EOE M/F/D/V

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Computer Applications Developer (assigned at various levels within Supervising Consultant/Manager designations depending on qualifications) based in Chicago, Illinois office. Under supervision of Manager or Partner consult with clients to determine needs and design, develop and implement custom e-commerce computer software applications operating on commercial Internet websites utilizing Java, SQL, Visual Basic, HTML, RDBMS, (including SQL Server, Sybase and Oracle), Active Server Pages and Data Warehousing. Requires M.S. or equivalent level degree in Computer Science, MIS, CIS, Engineering or related field. Successful applicants must be able to perform duties on date of application and must be presently eligible for permanent employment in the U.S.A. Salary $90,000.00-$98,000.00 per year depending upon qualifications, plus benefit plan and eligibility for bonus; 40 hour week with overtime as needed without additional compensation. Extensive travel. Multiple openings. send resumes to Ms. Stephanie Jones, Human Resources, Grant Thorton, LLP, 500 Washington Avenue, Suite 1200, St. Louis, Missouri 63101

Chicago Computer software consulting firm has openings for prog analyst positions. BS or MS in Comp Engineering or equiv. Req: 3 yrs exp. AS/400, Oracle, SQL, HTML, Java, VB Script, JavaScript. Unix programming and batch dvlpmnt. Design/develop, code, test and document computer prog and web based applica and position control functionality in the Oracle HRMS and financial sys for educ sector K-12 and Juvenile Justice Mgmnt sys. Compet salary and excl ben pkge. Send resume to: via e-mail: adc@adccorp.com or fax to ADC HR Dept. (312) 786-0323.

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We're seeking team players with strong technical and personal skills for the following positions:

Project Manager
- to analyze technical solutions for marketing projects to create & define online & legacy systems software & tables & manage progress through the delivery stage. Requires 5 years of experience in the job offered or 5 years of exp. as a Systems Engineer. Must have exp. with COBOL, C/C++, TCP/IP Sockets and Perl.

Project Leader
- to manage multiple online, client/server projects. Requires Bachelor's degree in Computer Science, Math, Engineering or a related discipline & 2 years of exp. in the job offered or 2 years of exp. in an applications/systems design/development occupation. Must have exp. with UNIX, TCP/IP, ORACLE, Mac OS, Windows NT & Sybase, which may be attained either through employment or education.

Senior Team Leaders/Team Leaders
- to coordinate & supervise a team of computer professionals performing system & application analysis, development, implementation & performance tuning. Requires 2 years of exp. in the job offered or 2 years of exp. in an application development position. Must have exp. with COBOL, FORTRAN & VMS Systems.
- to maintain Configuration Control & Operational System at client site. Requires Bachelor's degree in Computer Science , Math, Engineering or a related discipline & 3 years of exp. in the job offered or 3 years of exp. in a software design or development position. Must have exp. with ORACLE, C, UNIX & SQL.
- to provide on-site support, maintenance & troubleshooting of telecommunications customer care & billing system. Requires Bachelor's degree in Computer Science, Math, Eng'g or a related discipline & 2 years of exp. in the job offered or 2 years of exp. in a software design & development occupation. Must have exp. with PowerBuilder, UNIX, ORACLE, C, & COBOL.

Systems Analysts
- to design, code, test & debug billing applications. Requires Bachelor's degree in CS, Math, Eng'g, Business or a related discipline or 2 years of exp. in the job offered. Must have exp. with C, UNIX & Powerpoint, which may be attained either through employment or education.
- to code, maintain & update telecommunications software. Requires Bachelor's degree in CS, Math, Eng'g., Business or a related discipline. Must have exp. with C, which may be attained either through employment or education.
- to develop, test & implement software for the conversion of legacy data to a proprietary system. Requires Bachelor's degree in CS, math, Eng'g., Business or a related discipline. Must have exp. with UNIX & C, which may be attained either through employment or education.
- to analyze existing information processing systems for effectiveness. Requires Bachelor's degree in CS, Math, Eng'g., Business or a related discipline. Must have exp. with UNIX, ORACLE, SQL, C & C++, which may be attained through employment or education.

Programmer
- to develop & implement ordering management system client/server applications. Requires Bachelor's degree in CS or a related discipline. Must have exp. with : C++, Visual Basic, SQL, NT, PowerBuilder & UNIX, which may be attained either through employment or education.

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Computer/Info Systems

Oracle Applications DBA - Review and provide quality assurance and efficiency on requests going into software code or ad hoc queries. Requires Bachelor's degree and 5+ yrs exp. with database technology, knowledge of database administration, data modeling and design.

Director, Enterprise Business Applications - Manage all custom developed and packaged business applications across mainframe, client server and Internet platforms. Direct the implementation, development, support and training for applications. Requires Bachelors degree and 8+ yrs experience with Business Applications.

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Software Engineer

wanted by Custom S/ware Integration Firm in Houston, TX. Must have MS in Comp Sci & 2 yrs s/ware exp.

Respond to: Jon Gibson, BCS Systems, 1717 St. James Pl, Ste 400, Houston, TX 77056.

Senior Software Engineer wanted by Maryland based Comp Consulting Services Firm for job loc in Milwaukee, WI. Must have BS in Comp Sci, Data Proc, or Comp Studies & 6 yrs prgmg exp.

Respond to: HR Dept, Old Towne Consulting, Inc., 444 N. Frederick Ave, #E-347, Gaithersburg, MD 20877.

Programmer wanted by Toledo, OH Co. involved in Manufacture & Sale of Business Eqpmt. To dvlp, prgm & maintain forms printing backend of financial forms using JetForm technology. Must have Bach in Computer Science or professional equiv and detailed knowledge of the JetForm Technology Intel-based workstations and servers.

Respond to: HR Dept, Xerox Corporation, 801 Washington St, Toledo, OH 43624.

Network Administrator

sought by Wholesale/Retail Computer Products Co. in Elk Grove Village, IL. Must have Bach in Electronic Engg or Comp Sci and 1 yr exp coordinating dsgn, implmtn & support of network systems.

Respond to: HR Dept, United Comtec, Inc, 1730 Elmhurst, Elk Grove Village, IL 60007.

Database Analyst

(multiple positions) (Midlothian). Oracle database design & administration. Develop packages, procedures & functions in SQL/PLSQL. Create Shell scripts in UNIX. Evaluate interface btw hardware/ software & operational/ performance of systems.
REQD: MS or equivalent experience in job offered. Salary low 60's.
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Systems Analyst for NE OH IT Consultation & Services firm to analyze client user requirements, procedures & problems to improve existing computer systems for business applications. Develop, implement & integrate systems to SAP modules. Min. req. Bachelors degree in Computer Studies or equivalent based on credentials evaluation & 2 in-job exp. Must be willing to travel to OH, PA, VA, FL about 40-50 times/yr., 3-5 days/trip for about 90-95% of work time, or as otherwise required. 40 hrs/wk, 8am-5pm, M-F. OT as needed, $110,000.00/yr. Send 2 resumes & cover letters (no calls) to ES Sp Prgms REF #5976d, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

R&D Software Engineer, R&D, and implement DQRAP (Distributed Queuing Random Access Protocol) embodying MAC on micro controller or digital signal processor for network communication component. Resolve problems to facilitate network data transfer. Tools used are Window NT and Linux OS. Req. Ph.D in Computer Science and 1 yr. exp. in developing DQRAP using Linux OS. Send resume to Tom Olp, Manager, Qnet, 1600 Shore Rd., Suite B. Naperville, IL 60563

IT PROFESSIONALS
NETWORK ENGINEERS

Dallas based company specializing in software & hardware development seeks Network Engineers. Must have at least 2 years experience in UNIX/Windows NT & Bachelor's in Computer Science, Engineering or related field. Send resume to: Magdy Elwany, M & A Technology, 2045 Chenault Drive, Carrollton, TX 75006

Software Engineer: Uses various software engineering development techniques, tools, and utilities to design, modify, and implement a DB2 relational database management information system installed in an IBM mainframe IMS environment. Uses CICS, VSAM, JCL, TSO, and XPEDITOR in performance of all duties including use of COBOL and COBOL II programming for software engineering and software development purposes. Requires Master's degree in Computer Science, Mathematics, or Business Administration. Also requires one year experience in the job to be performed or one year experience as a Programmer/Analyst. If experience in related field, entire experience must include performance of all duties as specified in job offered. Hours: 8:00 a.m.-5:00 p.m. 40 hours per week at $55,000.00 per year salary. Two copies of resume to: Mike Brooks, File #C101448, DWE-ALC, P.O. Box 7972, Madison, WI 53707-7972.

Sr. Prgrmr/Analyst

Dallas, TX - Design & implement datawarehousing principles, design & devlp. processing modules, write hi-speed loader. Enhance/maintain bus. s/ware & computer prgrms, fine-tune applics., write code, prep. test plans. Install s/ware ensuring proper connectivity btn. clt. & server machines. Develop queries for data manipulation & interface classes, perform system integration and documentation. Provide tech. support; sprvs jr. prgrmr/analysts. Utilize Visual Basic, C/C++, MS-SQL Server, GUIs & Crystal Reports. Must have bachelor degree in Comp. Sci., Engnrg., Math or related area. At least 2 yr/exp. in similar position. 40 hr/wk (9-5); competitive salary w/excellent benefits.
Send resume & salary rqmts. to: Corporate Recruiter BLOCKBUSTER Inc., 1201 Elm St., Dallas, TX 75270 or careers@blockbuster.com Ref # ISSCW002

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Software Engineer. Sought by Denver Colorado consulting company to work in various unanticipated locations throughout the U.S. Research, design and develop computer software systems in conjunction with hardware product development. Analyze software requirements to determine feasibility of design within time and cost constraints. Consult with clients to define needs or problems. Perform system administration, implementation and maintenance. Use of Windows, C, C++, Perl, SolarisOS, VMS, SYBASE, ORACLE. Reqs. Master or foreign equivalent in Computer Science, Computer Eng., or related field of study. Plus 2 years in the job offered or 2 years in a related occupation such as Consultant. $73,700/year, 40/hrs/wk, 8AM-5PM. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. CO 4656944

Programmer Analyst. Sought by Englewood Colorado consulting company to work in various unanticipated locations throughout the U.S. Analyze, design, coding, testing, and documentation of system enhancements. Production support including, but not limited to, problem analysis and program debugging. Customize hardware and software to client needs. Use of MVS/ESA, DB2, SQL, CICS, COBOL, TSO/ISPF, IMS and JCL. Reqs. Bachelor's Computer Science Computer Engineering, Mathematics or related field of study. Plus 2 years in the job offered or 2 years in a related occupation including Analyst/Programmer. $85,000/year, 40/hrs/wk, 9AM-5PM. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 and refer to Job Order No. CO 4656947

Neotech Systems, Inc based in La Palma, CA is seeking exp'Ed "Software Engineers" - and "Prog/Analysts" skilled in some of the following: Oracle, C++, Java, VB, AS 400, COBOL, HTML/DHTML, IIS, ASP, MTS etc. Highly competitive salary, travel and relocation required. Some Positions require a MS or equiv. in CS, Engg, Math or related field and some require a BS or equiv. in any of the above with two yrs exp. Resumes to Neotech Systems, Inc. 6 Centerpointe Drive, Suite 630, Lapalma, CA 90623 or Email: jobs@neotechsystems.com.

System Software Engineer wanted by Co involved in Commercial Production of S/ware Products in Camarillo, CA. Must have BS in Comp Sci.

Respond to: HR Dept, Crescendo Interactive, Inc., 1601 Carmen Dr, Ste 103, Camarillo, CA 93010.

Software Eng wanted by Comp S/ware Dvlpt/Consulting Firm in Irvine, CA. Must have BS in Comp Sci or Math.

Respond to: HR Dept, Prism Computer Corporation, 2 Park Plaza, Ste 1060, Irvine, CA 92614.

Electrical Engineer (MTS)

Duties: Work as a member of a network design team, which designs and implements IP based services. In an HFC Network Environment, provide network and systems solutions for public managed Cable network services and work closely with operation personnel to implement the solution. Apply system engineering skills, verbal skills and writing skills to gather business requirements and translate them into a technical solution suitable for deployment to a large customer base. These solutions consist of HFC network design including routing protocols, DS-1, OC-3, IP Tunneling, inter networking, video and IP Telephony. This network is developed using Cisco operating systems, Sun Solaris operating system, and Windows NT operating systems. Apply these technologies across network management, billing, customer care, provisioning, trouble ticketing, and report generation. Lead IP Standards activities to determine a universal Architecture to support all IP based services over an HFC Network. Requires: B.S. Electrical Engineering or related plus Working knowledge of the following: 1. Routing protocols, access technologies, IP Tunneling, Video Services and, IP Telephony 2. Telecommunication Networking planning, Network Services planning, LAN and WAN Network planning and Data Network planning. 3. Network Management, Customer Care, Trouble Ticketing, Provisioning, Billing, and Management Reports 4. Windows NT and Cisco operating systems. Working Conditions: M-F 8a.m. to 5p.m. Salary: $70,000/yr. Location: Westminster, CO. Reply by resume only to Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to job order number CO4656871

Network Architect-Systems Engineer (MTS)

Duties: 1. Provide architecture solutions for the development of next generation network based on an Asynchronous Transfer Mode (ATM) technology. 2. Conduct analyses of ATM switching systems (including the evaluation of traffic management schemes using queuing theory and simulation in C, C++ or Java. 3. Define network requirements at both component (SONET, ATM and IP) and system levels for advanced networking services. 4. Develop carrier grade network and system architectures for wireline and wireless networks. 5. Evaluate and select vendor products. 6. Develop test plans and procedures, and to conduct tests to validate the capabilities and performance of selected vendor(s) products. Requires: M.S. Electrical Engineering or Computer Science plus Working knowledge and/or coursework in the following: 1. ATM and IP internetworking technology, including ATM switching systems, traffic management and queuing theory. 2. Components and systems with SONET transport technology over wireline and wireless networks. 3. Development of carrier grade requirements and evaluation against vendor products. 4. Simulation development using C, C++ or Java. Location: Boulder, CO; Working Conditions: M-F 8a.m to 5p.m. Salary: $66,000/year. Reply by resume only to Colorado Department of Labor & Employment, Employment Programs, Attn: Jim Shimada, Tower 2, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to job order number: CO4656874.

Sr. Software Engineer sought by software development company in Denver, CO, to work in Denver & other unanticipated job sites in the U.S., to, at a senior level, design & develop client/server, 3-tier, & web-based software applications that interface with Oracle & Sybase relational database management systems, & run on UNIX & Windows operating systems, &/or on the web. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications. Use Java, C++, C & PowerBuilder in the design & development process. Provide technical assistance to Software Engineers. Requires Master's or equivalent in Computer Science or related field (including Computer Engineering). Specifically, the position requires a Master's, or foreign degree equivalent, plus 3 yrs of progressively more responsible software development experience, or a Bachelor's, or foreign degree equivalent, plus 5 yrs of progressively more responsible software development experience. Working knowledge of client/server architecture, Oracle & Sybase PDBMS, & C/C++. $81,900/yr; M-F; 8am-5pm. (2 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 & refer to Job Order No. CO4658122.

Sr. Software Engineer sought by computer software consulting company in Colorado Springs, CO, to work in Manhattan, NY & other unanticipated job sites in the U.S., to, at a senior level, design & develop client/server & web-based software applications that interface with Oracle relational database management systems & run on a variety of platforms. Analyze requirements. Create designs & design documentation. Code, test, & debug the software applications. Use C++, Java, & other languages & tools in the development process. Provide technical assistance & guidance to software engineers. Requires Master's degree or equivalent in Computer Science or related field. Specifically, this position requires a Master's or foreign degree equivalent, plus 3 yrs of progressively more responsible experience designing & developing software applications, or a Bachelor's, or foreign degree equivalent, plus 5 yrs of progressively more responsible experience designing & developing software applications. Working knowledge of Oracle, Java, & web-based applications. $68,000/yr; M-F; 8am-5pm. (2 openings) Respond by resume to James Shimada, CO Department of Labor & Employment, Tower II, #400, 1515 Arapahoe St., Denver, CO 80202 & refer to Job Order No. CO4658120.

Senior Software Engineers (multiple positions) wanted by Co involved in design & sale of microprocessor dvlpt tools in Moorpark, CA. Must have BS in Comp Info Systems or Comp Sci & 3 yrs s/ware related exp.

Respond to: HR Dept, Signum Systems, 11992 Challenger Court, Moorpark, CA 93021.

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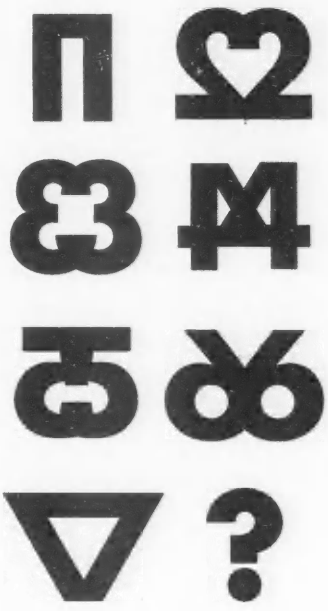

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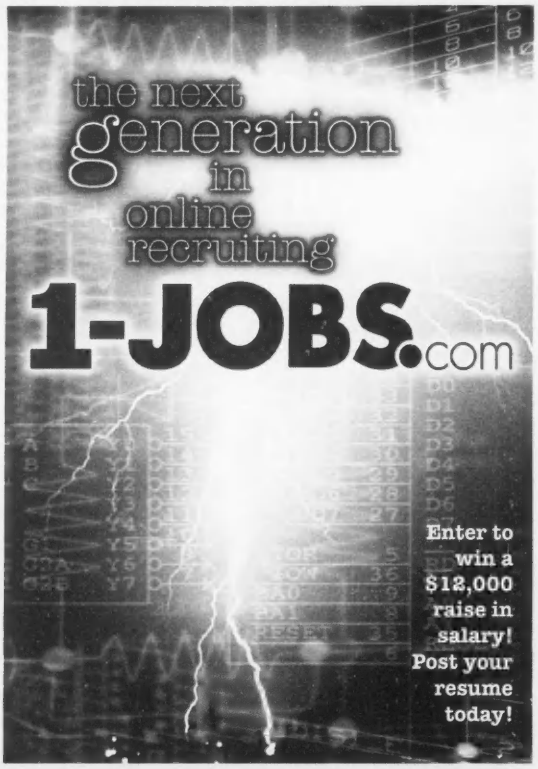

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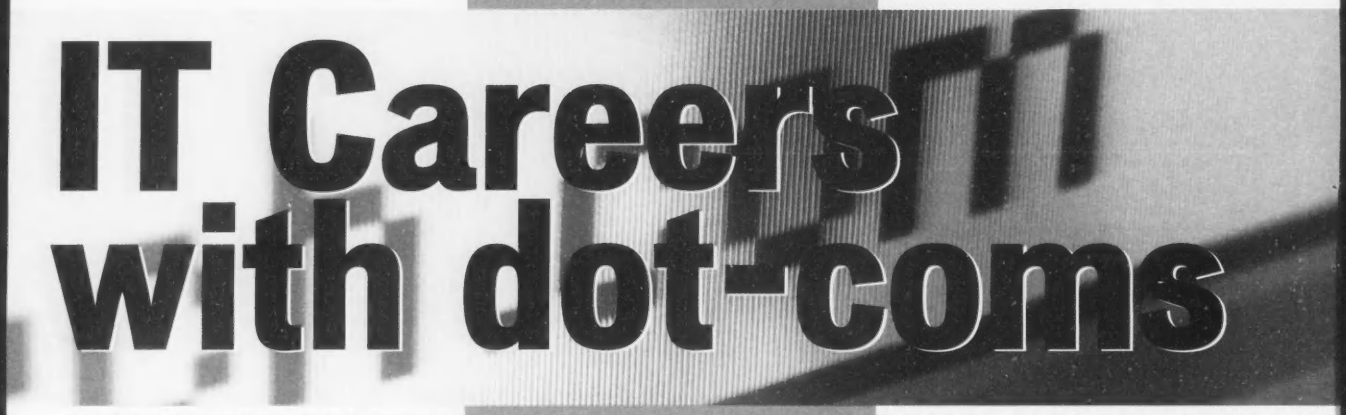
IT Careers with dot-coms



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Garden City, NY

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eWORK EXCHANGE

San Francisco, CA

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IT Careers with dot-coms

Load Media Network, Inc.

Los Angeles, CA

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TranScape
A Division of Pitney Bowes, Inc.

Minneapolis, MN/Shelton, CT

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TranScape provides tools critical to the survival of dot-coms – the "clicks and mortar" companies – such as Pets.com. These customers have seen their orders grow from dozens a day to thousands a day, and TranScape's products make sure they can handle their dramatic growth. "Whether they take in the order via the Internet, phone or fax, they can use our products to fulfill and track the orders," Javner says.

This tight link with the dot-coms has put TranScape in the position of needing many of the same skills, says Amy Kamarainen, director of human resources. "We have the stability of Pitney Bowes behind us, but this definitely is at the speed and technical level of a dot-com."

TranScape is hiring professionals at its Minneapolis and Shelton, CT, locations. "Mainly we are looking for software engineers who can move quickly through creative development to innovation to market," says Kamarainen. "We need people who are able to come up with fresh new ways to apply technology for our customers. That translates to needing skills such as Visual Studio, XML, ACTIVEX, Visual Basic and Java. One of the more important skills needed in Shelton is experience with embedded systems because we have a project in development that supports US Postal Service rate changes. Customers with a postage meter will need the software upgrade to make that change – software on a chip that goes into the postage system."

Other projects underway include ValueShip, an enhanced technology for shipping. Conquest, another project, will improve order fulfillment and uses a browser-based capability to give information access to an entire company.

"We need people driven to succeed and who have fun with their work," says Kamarainen. "We look for people who want to continue to learn, because that's an important aspect of our business. In 1999 we increased the amount of training for employees by 137 percent. Just as important, we are a company that wants to let you do the job and for you to assume leadership."

webMethods

Fairfax, VA

For webMethods, the entire ball game is the company's ability to help businesses exchange information over the Internet. Founded in 1996, the company uses the power of XML to help companies exchange information, interactively over the Internet, in a secure and bi-directional environment. The hallmark product, webMethods B2B, is an open system, allowing buyers and suppliers to link without altering existing legacy, proprietary or ERP applications.

"More than 50 percent of the world's economy is based on business-to-business commerce," says Bob Quinn, director of recruiting for webMethods. "We are literally in the middle of the biggest change to the world economy since the industrial revolution."

The company targets global 2000 customers and has doubled its employment in the past six months. Despite the new-century business model, webMethods bases its operation on a traditional and time-tested adage: treat people the way you want to be treated, according to Quinn. "We believe a culture built on this saying is what helps us keep our turnover very low (below 5 percent) and what makes webMethods an attractive place to work."

Currently the company is seeking people with experience in XML, Java, object-oriented design, C++ and those who have an understanding of EDI. "Just as important is experience in development of business, platform integration and quality assurance," says Quinn. "We need people who are committed to developing high quality software and who understand the pace and customer focus of this business."

Customers and projects range from Cisco to Bell Atlantic. Telco.buy recently selected webMethods to develop an online trading network for telecommunications suppliers and vendors. Federal Express is using the webMethods B2B product to integrate its transportation and information systems, with a goal of increasing business load capability.

Among the things Quinn looks for in analyzing resumes is for evidence of continuous learning. "We will provide training and support it," he says. "However, we want people who demonstrate that they want to own their continuous learning."

For more job opportunities with dot-com companies turn to the pages of IT careers.

Interested in IT Careers?

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.7607 or janis_crowley@itcareers.net.

Produced by Carole R. Hedden
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Answering that question is the focus of TranScape, a division of Pitney Bowes, Inc., and the premier carrier-independent order fulfillment and shipping software in the industry. "We started out by pioneering shipping and manifest systems," explains Vicki Javner, director of marketing communications. "Now our emphasis is on producing WAN and Internet-deployed software so that our customers can share order information throughout their enterprise. Our customers can ship and track their packages via the Internet and share the information with their internal and external customers."

TranScape provides tools critical to the survival of dot-coms – the "clicks and mortar" companies – such as Pets.com. These customers have seen their orders grow from dozens a day to thousands a day, and TranScape's products make sure they can handle their dramatic growth. "Whether they take in the order via the Internet, phone or fax, they can use our products to fulfill and track the orders," Javner says.

This tight link with the dot-coms has put TranScape in the position of needing many of the same skills, says Amy Kamarainen, director of human resources. "We have the stability of Pitney Bowes behind us, but this definitely is at the speed and technical level of a dot-com."

TranScape is hiring professionals at its Minneapolis and Shelton, CT, locations. "Mainly we are looking for software engineers who can move quickly through creative development to innovation to market," says Kamarainen. "We need people who are able to come up with fresh new ways to apply technology for our customers. That translates to needing skills such as Visual Studio, XML, ACTIVEX, Visual Basic and Java. One of the more important skills needed in Shelton is experience with embedded systems because we have a project in development that supports US Postal Service rate changes. Customers with a postage meter will need the software upgrade to make that change – software on a chip that goes into the postage system."

Other projects underway include ValueShip, an enhanced technology for shipping. Conquest, another project, will improve order fulfillment and uses a browser-based capability to give information access to an entire company.

"We need people driven to succeed and who have fun with their work," says Kamarainen. "We look for people who want to continue to learn, because that's an important aspect of our business. In 1999 we increased the amount of training for employees by 137 percent. Just as important, we are a company that wants to let you do the job and for you to assume leadership."

webMethods

For webMethods, the entire ball game is the company's ability to help businesses exchange information over the Internet. Founded in 1996, the company uses the power of XML to help companies exchange information, interactively over the Internet, in a secure and bi-directional environment. The hallmark product, webMethods B2B, is an open system, allowing buyers and suppliers to link without altering existing legacy, proprietary or ERP applications.

"More than 50 percent of the world's economy is based on business-to-business commerce," says Bob Quinn, director of recruiting for webMethods. "We are literally in the middle of the biggest change to the world economy since the industrial revolution."

The company targets global 2000 customers and has doubled its employment in the past six months. Despite the new-century business model, webMethods bases its operation on a traditional and time-tested adage: treat people the way you want to be treated, according to Quinn. "We believe a culture built on this saying is what helps us keep our turnover very low (below 5 percent) and what makes webMethods an attractive place to work."

Currently the company is seeking people with experience in XML, Java, object-oriented design, C++ and those who have an understanding of EDI. "Just as important is experience in development of business, platform integration and quality assurance," says Quinn. "We need people who are committed to developing high quality software and who understand the pace and customer focus of this business."

Customers and projects range from Cisco to Bell Atlantic. Telco.buy recently selected webMethods to develop an online trading network for telecommunications suppliers and vendors. Federal Express is using the webMethods B2B product to integrate its transportation and information systems, with a goal of increasing business load capability.

Among the things Quinn looks for in analyzing resumes is for evidence of continuous learning. "We will provide training and support it," he says. "However, we want people who demonstrate that they want to own their continuous learning."

For more job opportunities with dot-com companies turn to the pages of IT careers.

Interested in IT Careers?

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.7607 or janis_crowley@itcareers.net.

Produced by Carole R. Hedden
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Tellabs Inc.	15.0
PSINet Inc.	14.6
Procom Tech Inc.	13.8
Computer Sciences	8.4
@home Corp.	8.1

DOLLAR	
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Tellabs Inc.	7.44
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Computer Sciences	6.69
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Procom Tech Inc.	4.19
Yahoo Inc.	4.13

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Hyperion Software	-18.7
Madge Networks	-17.9
Kla Instruments	-17.7
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Network Computing Dev	-16.2
Juniper Networks Inc.	-16.0

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Nextel Communications	-16.50
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Motorola	-14.63

Linux Stocks Face More Challenges

Though the outlook for the OS remains good

BY DOMINIQUE DECKMYN

THE NEW market climate hasn't been kind to Linux stocks. And though tech analysts expect Linux to continue to expand its corporate installed base, few on the financial side say they expect share prices to bounce back soon.

While many dot-com operations have trouble turning a profit, at least they don't generally face the challenge many Linux outfits encounter: making money on what is essentially a free product.

INDUSTRY ALMANAC

"Even a market leader like Red Hat, which is the clear market share and brand leader, is being hammered," says Bill Epifanio, an analyst at J. P. Morgan Securities in New York.

Still, International Data Corp. in Framingham, Mass., estimates that Linux holds one-fifth of the server operating system market, and Novell Inc. (Nasdaq:NOVL) recently admitted that Linux growth has hurt NetWare sales

Epifanio still rates Durham, N.C.-based Red Hat Inc. (Nasdaq:RHAT) a "long-term buy," meaning investors should consider the stock, but not rush into it.

The outlook for other Linux companies is mixed. Caldera Systems Inc. (Nadaq:CALD) in Orem, Utah, had a lackluster initial public offering (IPO) in March and last Tuesday closed at $11, well below its $14 IPO price.

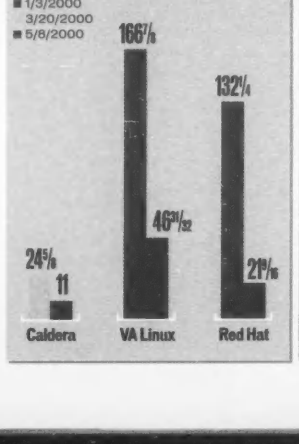
Because it sells PCs with Linux installed, VA Linux Systems Inc. (Nasdaq:LNUX) in Sunnyvale, Calif., ($47 last Tuesday, down from a peak of $320) has revenue from hardware sales. However, Epifanio says, the company has to compete for that revenue with other PC makers like Dell Computer Corp. in Round Rock, Texas.

Linuxcare Inc. in San Francisco, by contrast, is aimed squarely at services, supposedly the most profitable Linux market. However, it canceled its IPO two weeks ago.

"We would continue to avoid these [Linux] stocks until the current tech correction completes and the companies operating in this space get a couple of quarters under their belts in regard to hitting the numbers," says Fred Dickson, an analyst at Branch Cabell & Co. in Richmond, Va.

Lowered Expectations

Drops in the stock market have hit Linux companies hard.



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SOFTWARE OFF -5.5%					
ASWX	149.12	11.00	Active Software (H)	31.75	-4.63	-12.7
ADBE	131.00	30.81	Adobe Systems Inc	109.00	-8.00	-6.8
ARBA	183.24	15.25	Ariba Inc	68.56	-9.56	-12.2
AZPN	55.37	8.12	Aspen Technology Inc	31.75	-4.25	-11.8
ADSK	56.06	17.00	Autodesk Inc	35.06	-1.94	-5.2
AVID	25.56	9.43	Avid Technology	12.09	-0.59	-4.7
BAANF	17.81	2.00	Baan Co. N.V.	2.13	-0.25	-10.5
BMCS	96.62	36.00	BMC Software Inc.	43.75	-0.63	-1.5
BOBJ	150.87	11.06	Businessos Objects S.A	63.50	-9.75	-10.5
CDN	24.62	9.18	Cadence Design Systems	16.88	-1.50	-8.2
CHKP	295.00	16.62	Checkpoint Software Tech. Ltd.	167.25	-16.75	-10.1
CTXS	122.31	20.18	Citrix Systems Inc	51.81	-7.31	-16.4
COGN	41.12	9.68	Cognos Inc.	33.38	-3.69	-9.9
CA	79.43	40.93	Computer Associates Int'l Inc.	49.88	-3.44	-6.4
CPWR	40.00	10.06	Compuware Corp. (L)	10.50	-0.88	-7.7
DCTM	106.00	12.18	Documentum	50.94	-5.44	-9.6
EFII	69.31	35.00	Electronics For Imaging	54.00	-3.38	-5.7
HNCS	130.00	18.00	Hnc Software	44.38	-1.25	-2.7
HYSL	65.00	12.00	Hyperion Software	23.69	-5.44	-18.7
IDIC	49.12	15.31	IDX Systems	18.00	-1.88	-9.4
INFA	110.87	9.50	Informatica Corp	46.19	-1.94	-4.0
IFMX	21.25	6.03	Informix Software Inc.	8.72	-1.41	-13.9
INTU	90.00	22.50	Intuit	29.13	-5.38	-15.6
JAVY	41.31	15.50	Jack Henry Associates	38.13	-0.87	-2.5
JDEC	48.31	11.56	J.D. Edwards & Co.	14.81	-0.06	-0.4
LGTOE	82.50	9.25	Legato Systems Inc. (L)	12.86	-0.11	-0.9
MACR	100.00	27.37	Macromedia Inc.	83.00	-3.88	-4.5
MANU	70.25	7.50	Manugistics Group Inc.	33.00	-3.50	-9.6
MENT	18.50	7.75	Mentor Graphics	15.75	-0.53	-3.5
MSFT	119.83	55.00	Microsoft Corp.	69.31	-2.00	-2.8
NETA	37.18	11.62	Network Associates	23.88	-1.94	-7.5
NMH	140.00	48.75	Network General	86.31	-3.00	-3.4
NOVL	48.56	9.56	Novell Inc. (L)	10.31	-0.69	-6.3
ORCL	90.00	11.28	Oracle Corp.	75.56	-0.19	-0.2
PMTC	35.93	7.37	Parametric Technology Corp	10.44	-1.66	-18.9
PSFT	27.75	12.00	PeopleSoft Inc. (L)	14.06	-0.06	-0.4
PIXR	50.62	33.12	Pixar	35.31	-2.50	-6.6
RATL	105.00	26.37	Rational Software Corp.	73.44	-10.69	-11
RHAT	151.31	7.00	Red Hat Inc.	22.50	-2.58	-1
QSFT	98.12	7.00	Quest Software	39.38	-2.63	-6.4
SAPF	85.93	29.37	SAP AG	46.00	-3.94	-7.9
SCUR	29.62	2.25	Secure Computing Corp.	12.38	-1.38	-10.0
SDRC	23.43	8.81	Structural Dynamics Research	13.00	-0.63	-5.1
SYBS	31.00	7.12	Sybase Inc.	23.88	-1.00	-4.0
SYMC	81.62	17.75	Symantec Corp.	58.63	-2.94	-4.8
SNPS	75.62	26.81	Synopsys	39.94	-0.13	-0.3
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TIBX	147.00	5.00	Tibco Software Inc.	84.63	-20.05	-23.7
TSAI	48.12	12.75	Transaction Sys. Architects	16.00	-1.19	-6.9
VRTS	174.00	19.05	Veritas Software Corp.	97.88	-5.56	-5.7
WIND	56.12	13.37	Wind River Systems Inc.	35.50	-1.94	-4.9
TELECOMMUNICATIONS CARRIERS OFF -5.6%						
AT	91.81	55.67	Alltel Corp.	61.94	-2.94	-4.5
ANDW	31.75	11.18	Andrew Corp.	29.94	0.94	3.3
T	63.00	35.50	AT&T (L)	37.56	-1.44	-3.7
BCE	137.50	24.00	BCE Inc. (L)	25.75	92.25	78.2
BEL	69.50	47.37	Bell Atlantic	52.19	-0.94	-1.7
BLS	53.50	34.93	Bell South	46.81	1.00	2.2
BRW	41.06	16.31	Cincinnati Bell Inc.	28.75	0.00	0.0
CMCSK	57.68	31.18	Comcast (L)	32.68	-2.13	-6.1
CQ	37.06	15.37	Comsat Corp.	25.50	0.44	1.7
COX	58.37	33.37	Cox Communications Inc.	41.19	2.88	7.5
GSTRF	53.75	7.87	Globalstar Telecom. Ltd.	9.22	-1.03	-10.1
GTE	78.50	55.81	GTE Corp.	63.63	0.75	1.2
NXTL	165.87	33.00	Nextel Communications	98.00	-18.50	-15.9
SPOT	74.75	29.00	Panamsat	39.38	-4.44	-11
QCOM	200.00	21.50	Qualcomm	101.31	8.19	7.5
SBC	59.87	34.81	SBC Communications	44.25	1.44	3.4
FON	75.93	42.62	Sprint Corp.	58.94	-7.75	-2.9
TDS	137.00	59.75	Telephone and Data Systems	108.12	-3.38	-3.2
USW	81.50	51.50	US West	76.88	4.38	6.0
VIA	63.31	36.68	Viacom	55.31	-0.63	-1.1
WCII	66.50	24.00	Winstar Communications Inc.	36.56	4.38	10.7
WCOM	64.50	37.75	MCI Worldcom Inc.	41.56	2.19	5.0
SERVICES OFF -2.8%						
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AMSY	44.37	19.75	American Mgt. Systems	32.63	3.25	9.1
AUD	56.00	37.37	Automatic Data Processing	52.19	0.31	0.6
BSYS	69.00	41.37	Bisys Group Inc.	60.13	-2.38	-3.8
CATP	27.00	6.81	Cambridge Technology Ptnrs	9.97	-0.03	-0.3
CEN	36.87	14.75	Ceridian	22.94	0.81	3.7
CBR	29.31	13.75	Ciber Inc.	17.81	-0.56	-3.1
CDO	57.25	17.43	Comdisco Inc.	29.63	2.00	6.3
CHRZ	27.12	10.37	Computer Horizons Corp.	12.56	-0.56	-4.3
CSC	64.93	57.31	Computer Sciences	85.94	6.69	8.4
DST	76.43	51.18	Dst Systems Inc.	72.88	0.81	1.1
EDS	76.68	47.87	Electronic Data Systems	61.69	0.06	0.1
FDC	54.75	38.93	First Data Group	49.50	0.94	1.9
FISK	46.81	24.12	Fiserv	44.16	-1.84	-4.0
IT	24.93	9.56	Gartner Group	12.13	1.50	11.0
KEA	25.00	18.06	Keane	26.56	-1.88	-6.6
NDC	52.06	21.75	National Data	25.19	1.94	7.1
PAYX	57.37	23.56	Paychex Inc.	47.19	-0.44	-0.9
PER	23.62	15.31	Perot Systems Corp.	16.50	0.94	5.4
REGI	9.75	2.25	Renaissance Worldwide	2.88	0.06	2.2
REY	33.00	17.75	Reynolds & Reynolds	26.06	0.31	1.2
SFE	99.00	15.85	Safeguard Scientifics	41.63	3.13	7.0
SAPE	151.18	71.47	Sapient Corp.	97.50	2.63	2.6
SMS	73.50	35.50	Shared Medical Systems	71.88	0.69	1.0
SDS	40.00	16.67	Sungard Data Systems	32.38	0.31	1.0
SYNT	20.93	7.75	Syntel Inc.	11.66	-0.34	-2.9
TECD	44.68	18.00	Tech Data	39.25	-2.13	-5.1
TENF	76.87	17.00	TenFold Corp.	21.44	2.94	12.1
TSS	20.62	14.12	Total System Services, Inc.	19.63	0.13	0.6
TSAI	48.12	12.75	Transaction Sys. Architects	16.00	1.19	6.9
NETWORK OFF -5.6%						
COMS	119.75	22.62	3Com Corp.	42.94	0.19	0.4
ADCT	64.50	17.18	ADC Telecommunications Inc.	62.00	0.69	1.1
ANTC	61.25	23.25	Antec	45.50	6.31	12.2
BNYN	40.56	6.25	Banyan Systems Inc.	11.44	2.06	15.3
CS	52.75	8.50	Cabletron Systems	25.50	-0.75	-2.9
CNEBF	8.00	2.87	Call-Net Enterprises	3.69	0.13	3.3
CSCO	82.00	25.93	Cisco Systems Inc.	61.44	6.06	9.0
EDL	29.43	23.75	EDI Telecom	28.69	0.50	1.8
ENTU	150.00	16.87	Entrust Technologies Inc.	50.13	3.81	7.1
HRS	40.62	15.50	Harris Corp.	33.31	2.00	5.7
GMH	140.00	48.75	Hughes Electronics/GM	86.31	-3.00	-3.4
ERICY	76.31	6.59	LM Ericsson (L)	19.75	2.20	10.0
JNPR	312.93	11.23	Juniper Networks Inc.	161.50	30.75	16.0
LU	64.18	49.81	Lucent Technologies	57.69	1.81	3.0
MADGF	17.37	1.43	Madge Networks	4.00	0.88	17.9
NCDI	9.62	1.31	Network Computing Dev.	1.84	-0.38	-16.7
NWK	14.81	7.31	Network Equipment Tech. (L)	8.19	0.13	1.6
NN	43.62	14.00	Newbridge Networks (H)	40.44	-2.31	-5.4
NOK	60.00	16.92	Nokia Corp.	54.88	-1.25	-2.2
NT	72.09	18.64	Northern Telecom Ltd.	53.00	-4.72	-8.2
PAIR	27.12	8.00	Pairgain Technologies Inc. (H)	26.06	0.31	1.2
PCTL	15.21	2.75	Picturetel	3.88	-0.38	-8.8
SFA	77.00	15.84	Scientific Atlanta	58.13	-8.38	-12.6
TLAB	77.25	41.81	Tellabs Inc.	56.94	-7.44	-15.0
USW	61.50	51.50	US West	76.88	4.38	6.0
VRLK	22.00	1.81	Verilink	8.38	1.19	12.4
WSTL	40.75	5.50	Westell Technology Inc.	22.25	-0.69	-3.0
SEMICONDUCTORS, CHIPS & EQUIPMENT OFF -7.7%						
ADPT	63.56	17.37	Adaptec Inc. (L)	20.69	-0.56	-2.6
AMD	92.37	15.62	Advanced Micro Devices (H)	88.00	-3.69	-4.0
ALTR	108.00	30.00	Altera	96.25	-12.56	-12.7
ADI	94.68	17.53	Analog Devices	62.88	-5.63	-8.2
AMAT	119.00	25.37	Applied Materials	87.19	-13.88	-13.7
ASML	50.25	12.12	ASM Lithography Holding	34.88	-4.75	-12.0
FCS	49.50	18.50	Fairchild Semiconductor Corp.	44.50	-0.88	-1.9
HRS	40.62	15.50	Harris Corp.	33.31	-2.63	-5.7
INTC	145.37	50.12	Intel Corp.	117.56	-4.19	-3.4
KLAC	97.75	21.18	Kla Instruments	53.06	-11.44	-17.7
LLTC	82.50	24.75	Linear Technology	53.75	-1.75	-3.2
LSI	90.37	16.71	LSI Logic	50.75	-4.00	-7.3
MXIM	74.50	24.50	Maxim Integrated Products	59.63	-7.63	-11.3
MU	72.65	17.12	Micron Technology	62.00	-1.06	-1.7
MOT	184.62	76.18	Motorola	95.88	-14.63	-13.2
NSM	85.93	12.25	National Semiconductor	54.56	-3.81	-6.5
STM	73.87	16.87	SGS-Thomson Microelectronics	61.94	-3.88	-5.7
SLR	49.50	24.15	Solectron Corp.	34.44	-2.13	-5.8
TER	115.43	21.84	Teradyne	91.06	-16.94	-15.7
TXN	199.56	50.15	Texas Instruments	142.63	-12.44	-8.0
JDSU	153.42	14.89	Uniphase	90.13	-3.69	-3.9
VTSS	115.68	22.37	Vitesse Semiconductor Corp.	53.97	-8.91	-14.6
XLNX	88.43	19.50	Xilinx	62.31	-5.19	-7.7
COMPUTER SYSTEMS OFF -3.5%						
AAPL	150.37	40.93	Apple Computer Inc.	109.31	-4.56	-4.0
ASPX	19.00	3.87	Auspex Systems	6.38	-0.94	-12.8
BEOS	39.56	3.28	Be Inc.	6.56	-1.06	-12.9
CPQ	34.00	18.25	Compaq	27.44	-0.25	-0.9
DELL	59.68	31.32	Dell Computer Corp.	49.81	-0.75	-1.5
GTW	84.00	28.37	Gateway 2000 Inc.	53.63	-0.56	-1.1
HWP	155.50	67.00	Hewlett Packard Co.	135.94	-1.06	-0.8
HIT	164.50	67.00	Hitachi Ltd.	123.75	-5.88	-4.5
IBM	139.18	89.00	IBM	105.00	-2.94	-2.7
MUEI	20.68	9.00	Mitrex	10.19	-0.06	-0.5
MOT	184.62	76.18	Motorola	95.88	-14.63	-13.2
NATI	59.50	21.50	National Instruments Corp.	39.56	-6.19	-13.5
NCR	92.62	26.68	NCR	38.19	-0.38	-1.0
NIPNY	149.50	53.18	NEC	128.19	-14.44	-10.1
PRCM	89.75	-3.43	Procom Tech Inc.	34.50	4.19	13.8
SGI	18.87	6.25	Silicon Graphics Inc. (L)	6.50	-0.56	-8.0
SNE	314.75	89.75	Sony	217.69	-3.81	-1.7
SUNW	106.75	26.98	Sun Microsystems	82.50	-7.13	-7.9
TRCD	22.75	1.53	Tricord Systems	11.25	-0.38	-3.4
WIS	49.68	19.50	Unisys	24.50	-0.44	-1.8
INTERNET OFF -2.9%						
AMZN	113.00	40.81	Amazon.com Inc.	54.81	-3.00	-5.2
AOL	95.81	38.46	America Online Inc.	55.19	-1.69	-3.0
AIHM	60.12	15.67	@home Corp.	19.19	-1.44	-6.9
CNTR	125.62	23.12	Checkfree	66.75	-4.44	-6.6
CYCH	17.68	6.56	Cybercash Inc.	7.31	-0.19	-2.5
EBAY	255.00	70.28	eBay Inc.	123.50	-12.25	-9.0
ETYS	86.00	4.50	eToys Inc.	6.28	-0.63	-9.0
EGRP	60.43	16.06	ETrade Group Inc.	19.94	-0.13	-0.6
LCOS	93.62	28.56	Lycos Inc.	57.56	7.75	15.6
OMKT	65.50	7.87	Open Market Inc.	10.75	-1.94	-15.2
OTEX	60.62	9.50	Open Text Corp.	23.38	0.31	1.4
PCLN	158.87	45.56	Priceline.com Inc.	49.81	-7.97	-13.8
PRGX	35.43	8.25	Prodigy Communications	11.81	-0.19	-1.6
PSIX	60.93	15.52	PSINet Inc.	25.00	-3.19	-14.6
RSAS	93.06	15.87	Security Dynamics	56.25	-3.75	-6.3
SPYG	95.25	9.68	Spyglass Inc.	43.75	-8.75	-16.8
WINK	75.00	6.00	Wink Communications Inc.	24.28	-0.66	-2.6
YHOO	250.06	55.00	Yahoo Inc.	129.50	4.13	3.3
STORAGE & PERIPHERALS OFF -5.0%						
ADPT	63.56	17.37	Adaptec Inc. (L)	20.69	-0.56	-2.6
APCC	45.00	15.75	American Power Conversion	32.94	-0.44	-1.3
CANNY	49.37	23.00	Canon Inc.	45.50	-3.63	-7.4
DBD	32.75	19.68	Diebold Inc. (H)	30.63	-1.06	-3.4
EK	79.81	53.18	Eastman Kodak Co. (L)	55.69	-1.94	-3.5
EMC	145.43	47.31	EMC	130.50	-7.81	-5.6
IOM	6.37	2.87	Iomega	3.31	-0.31	-8.6
MXTR	14.81	4.25	Maxtor Corp.	11.38	0.00	0.0
NTAP	124.00	9.84	Network Appliance Inc.	60.75	-9.31	-13.3
LXN	135.87	56.50	Lexmark International Group, Inc.	96.44	-7.63	-7.3
SEG	75.43	25.12	Seagate Technology	46.00	-2.00	-4.2
STK	27.18	11.37	Storage Technology	11.75	-1.63	-12.1
TEK	71.75	22.12	Tektronix	54.38	-3.19	-5.5
XRX	63.93	19.00	Xerox	27.31	-0.44	-1.6

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Subscription rates: U.S., $48/year; Canada, $110/year; Central and South America, $150/year (surface); all others, $295/year

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It Was Déjà Vu All Over Again

'Love Bug,' like the Melissa virus, raises old issues in Washington

BY PATRICK THIBODEAU

SHORTLY AFTER the Melissa virus struck a year ago, Keith Rhodes, who heads the U.S. General Accounting Office's information technology division, warned Congress that the next virus would be faster and do more damage. He was right.

But Rhodes didn't gloat when he appeared last week before the U.S. House Subcommittee on Technology in the wake of "The Love Bug." Instead, he renewed his criticism that the government isn't responding quickly enough to computer threats.

"Like Melissa more than a year ago, little information was available early enough for agencies to take proactive steps to mitigate the damage," said Rhodes. The FBI's National Infrastructure Protection Center didn't issue a notice about the virus until 11 a.m. on May 4, well after the virus had done much of its damage, he said.

Although some federal agencies appeared to respond quickly to the problem, the virus did cause damage. Most notably, the U.S. Department of Defense said some of its classified systems were infected.

At the U.S. Department of Commerce, other than some interruptions of e-mail service, the virus affected only 500 of 40,000 end users in varying degrees, said CIO Roger Baker. "It didn't bring us down," he said.

"The human systems reacted pretty well to this one. People saw it early, reacted to it early and took some fairly substantial actions to keep it from spreading," said Baker. Those actions included cutting off attachments from e-mail.

The U.S. Department of Veterans Affairs was "pretty widely hit" by the virus, which forced a shutdown of e-mail systems, said one IT worker. But turning off the e-mail system Thursday also cut off the chief means for warning employees about the danger.

"We learned some lessons in our incident response. One is you can't always rely on e-mail to communicate with people," the IT worker said. Telephones and fax machines were used as backup methods to contact employees.

"The Love Bug's" legacy will last long after it has been deleted from most systems. It has spurred renewed calls for tougher computer crime legislation and for someone in government to oversee information security.

The government needs a single "cyberczar," said Harris N. Miller, president of the Information Technology Association of America in Arlington, Va. This individual could play a role similar to the one former federal Y2k chief John Koskinen had in organizing a government response to the year 2000 problem, Miller said. The government needs someone who has "the authority and the ear of the president and can coordinate responses across government agencies," he added.

In Congress, a bill introduced by U.S. Sens. Charles Schumer (D-N.Y.) and Orrin Hatch (R-Utah) just a few weeks before the virus struck would make it illegal to forge or alter a header to avoid identifying the sender. The bill also includes provisions intended to improve the ability of federal, state and local agencies to prosecute computer criminals.

But Mark Gembecki, president of information security firm WarRoom Research Inc. in Linthicum, Md., said new laws won't help unless companies, despite being fearful of exposing their security problems, are willing to seek law enforcement help.

"If you can't even address that, why are you bothering to pass another law? You're adding one more thing out there that is not going to be enforced," said Gembecki.

> The human systems reacted pretty well to this one. People saw it early . . . and took some fairly substantial actions.
>
> ROGER BAKER, DEPARTMENT OF COMMERCE CIO

MORE THIS ISSUE

For more stories on computer security and "The Love Bug," **see pages 4, 6 and 8.**

Federal Fallout

"The Love Bug" managed to worm its way into a number of federal agencies, causing varying degrees of damage.

IMPACT:
At least 14 federal agencies, including the Central Intelligence Agency, and the U.S. House and Senate were infected. The Defense Department said a small percentage of its classified systems were infected. Some Pentagon machines required complete software reloads.

POTENTIAL SOLUTIONS:
The U.S. General Accounting Office says faster alert mechanisms are needed, as well as improvements in federal agency security controls.

OUTLOOK:
The GAO believes the next virus will "propagate faster, do more damage."

Continued from page 1

Windows

which crackers can turn several of Windows' useful features into weapons against users, said Josh Turiel, network services manager at Holyoke Mutual Insurance Co. in Salem, Mass.

For instance, Turiel said, "the good thing is, Microsoft provides some very nice tools for integrating applications," such as Outlook, Internet Explorer and Exchange. The downside is that viruses are able to spread that much more quickly precisely because of such integration, he said.

The current virus outbreak, for example, exploited an "exceedingly useful" feature called Windows scripting host, which lets administrators automate certain tasks by writing a script. But it interacts in "unanticipated ways with the mail-reading program," Stringer-Calvert said.

Another crucial fact is that platforms such as Windows 95 and Windows 98 grew out of a stand-alone desktop system environment that wasn't really designed for internetworked use, analysts and users said.

Several of the key usability features, such as the ability for users to install software or configure a system, pose a security risk in a networked environment, because what one user does can affect all the others, said Laura DiDio, an analyst at Giga Information Group Inc. in Cambridge, Mass.

"It brings us to the basic question of usability vs. security," DiDio said.

Reasons such as those make Windows users more vulnerable to virus attacks than users of Linux, Unix or Macintosh operating systems, where security is more of an architectural consideration. Therefore, it's crucial to protect yourself, said Tina M. Hynes, a software systems analyst at Directec Inc., a computer parts wholesaler in Louisville, Ky.

Though the company was hit by the "I Love You" virus and two similar Visual Basic script viruses recently, damage was minimal. "One thing that saved us a lot of grief was that all of our workstations and servers run Windows NT, where scripting just does not run out of the box like it does on Windows 95 and Windows 98," she said. Also key was the company's use of antivirus software.

Essential to minimizing exposure to such attacks is keeping virus protection software constantly updated, agreed Hugh Hale, manager of MIS at BlueCross/BlueShield of Tennessee in Chattanooga.

The company had to shut down all external e-mail for two days while the virus was weeded out of its systems. "About the only thing you can do is pick the best antivirus vendor out there and do the best to stop attachments of any kind being sent from inside or outside your systems," Hale said.

Also needed are restrictive policies that block out all executable files sent via e-mail, Turiel said. Holyoke has a formal policy prohibiting transmission of executable files in addition to technology for filtering out all e-mails with executable attachments.

Staff writer Kathleen Ohlson contributed to this story.

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FRANK HAYES/FRANKLY SPEAKING

Game of delay

IT'S NOT SO HARD to understand Microsoft's legal strategy. Microsoft's lawyers insist they'll win big on appeal. But they're also in no hurry to get to the appeals court — they want six more months to explain why breaking up the company is a bad idea. But if they'll win on appeal anyway, why take all that time? Because you never know what might happen. An appeal is risky — you might lose. But in the meantime, a new president might tell the Justice Department to dump the case. The state attorneys general might go back to chasing Big Tobacco. A judge might drop dead. It might be an ugly victory — but a good lawyer would rather win ugly than lose pretty.

So Microsoft's strategy is to win on appeal — but delay that appeal as long as possible. Delaying is standard legal practice. It's probably good legal strategy.

But three things make it a very, very risky business strategy for Microsoft.

First is Microsoft's sinking stock price. Forget that Microsoft no longer has the biggest market capitalization and that Bill Gates might stop being the world's richest man. That's trivia.

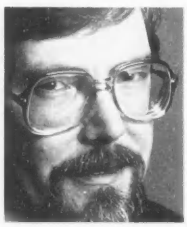
What matters is that since December, Microsoft's market collapse has cost mutual funds and other institutional investors $118 billion. And the stock isn't rebounding from the guilty verdict and the breakup proposal — it's edging lower. That is not a trend big investors like.

Nor do they like Microsoft's ho-hum earnings last quarter. This company used to smash analysts' estimates and double its stock price every year. Now the stock drifts and earnings barely meet expectations.

If big investors bail on Microsoft, the price will fall even more. And that capital will flow to Microsoft's rivals, old and new — big enemies like IBM, Sun and Oracle and small start-ups that could carve the ground from beneath Microsoft's feet. And lower prices will make options less effective in hiring new talent and make the stock a cheaper currency for acquiring new technologies.

The second factor is the public. People *like* Microsoft, really they do. Poll after poll indicates they like Microsoft better than the Justice Department, and they don't want Microsoft broken up.

Three things make delay a risky strategy for Microsoft.



But in the latest Gallup poll, though most people still oppose a breakup, they now say a breakup would be good for the economy. And for the computer industry. And for consumers.

In other words, the public likes Microsoft — but is starting to believe breaking it up would be a good thing. Another six months of that trend won't be healthy for Microsoft either.

The third factor? Technology itself. Microsoft gives lip service to the idea that any competitor might topple it at any time. That's hogwash — but with dozens of competitors attacking successfully on a dozen fronts, while Microsoft's top strategic brains are doing lawsuit damage control, Microsoft *is* at risk.

Linux carves into NT's turf. Palm dominates in handhelds. America Online stomps all over Microsoft in instant messaging. Microsoft can't get a foothold in business-to-business exchanges or high-end enterprise software.

Y2k lockdowns gave Microsoft breathing room — nobody was buying new technology. But now, every day Microsoft is distracted by the antitrust case is running room for all those competitors, and they know it. They don't have to catch Microsoft — just outrun it.

So, good legal strategy or not, Bill Gates and Steve Ballmer should think very, very carefully about whether delays will deliver what Microsoft needs. Between the stock price, the public and technology, dragging this case out may be much more dangerous for Microsoft than just getting it over with. ◗

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

SPIKED Consultant pilot fish is sysadmin at a regional military site. Brass throws an educational conference for the region's sysadmins. But after five requests, fish can't get an OK, so he doesn't go. Flash forward to annual-review time: The fish learns his raise is spiked because, according to his on-site supervisor, he "lacks the knowledge necessary to complete [his] tasks effortlessly" – the knowledge he *would* have gained at the conference. Oh, and he also got dinged for not going to enough conferences.

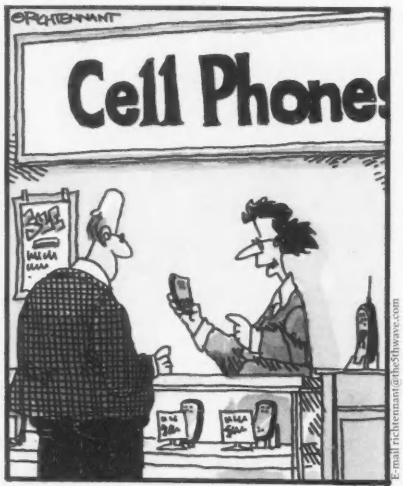
CLAIRVOYANCE REQUIRED Software developer pilot fish who's prototyping an insurance-policy processing system (it'll handle 50,000 renewals every night) gets this helpful specification from a longtime user-side manager: "We want the system to process these automatically every time, except when we want to override it."

TIME AND MOTION MEN Telecom company sets up a training session for salespeople in Charlotte, N.C. Why not hold it where the software developers work, in Greensboro, 85 miles away but with a better training facility? asks a pilot fish. Because this session is for the salespeople, says the boss in faraway New Jersey. So seven programmers, two sales reps and the trainer travel more than 1,000 total miles to Charlotte – all via Greensboro – to join the lone sales rep from Charlotte.

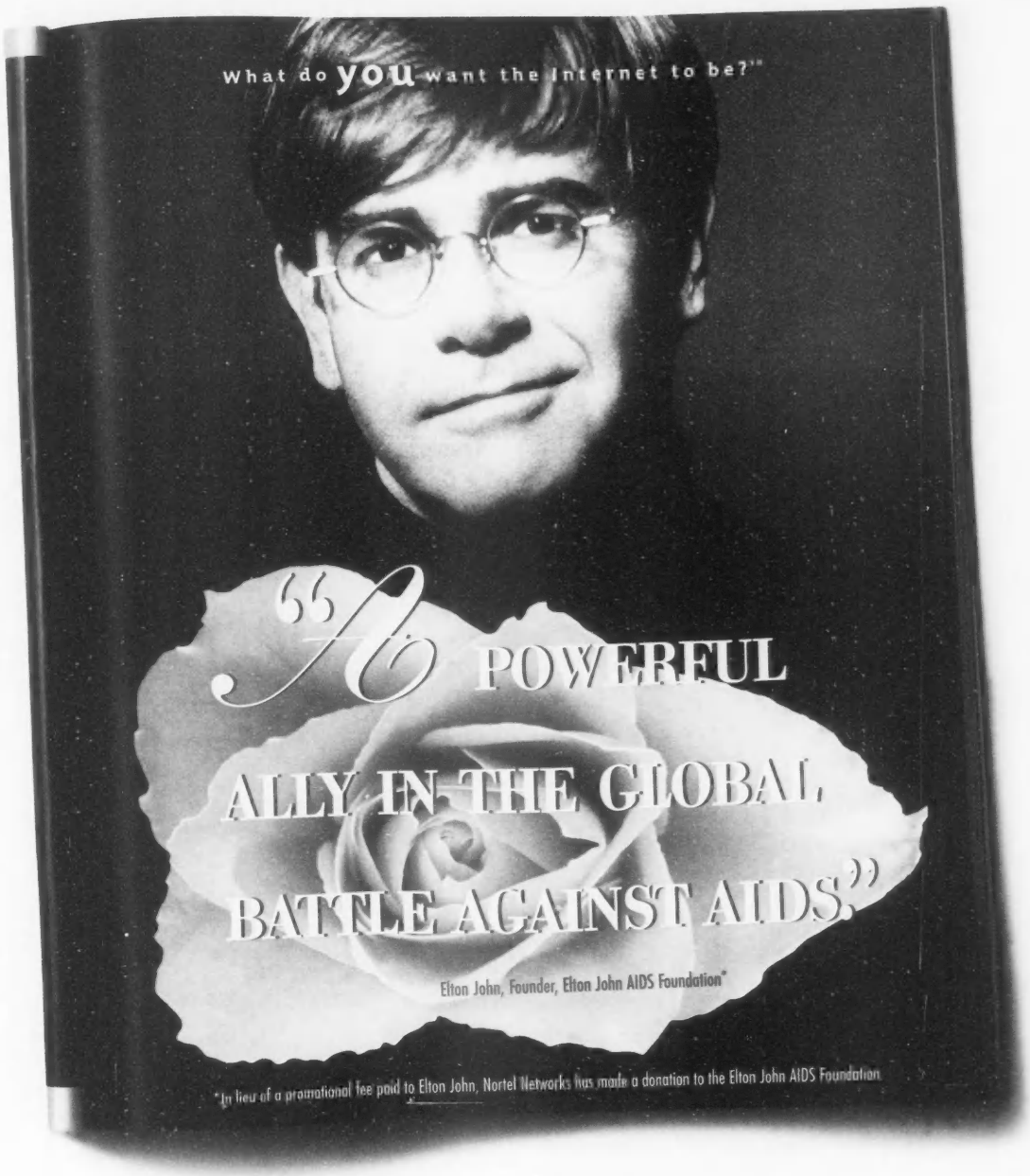
STILL SPREADING THE LOVE Vice president gets an "I Love You" e-mail from the president of a big computer supplier. Antivirus software tells him it's infected and refuses to open it. Not to be thwarted, VP forwards the message to himself, plugs his antivirus-free laptop into the network and opens the infected e-mail. "I spent six hours cleaning up the mess," security pilot fish reports.

Report *your* mess: **sharky@computerworld.com**. If it prints, you get a Shark shirt. And get more online every day at *computerworld.com/sharky*.

The 5th Wave



"This model comes with a particularly useful function – the simulated static button for breaking out of long winded meaningless conversations."



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